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FOR THE HOME AND HOME OFFICE

AUGUST 1987

VOLUME 5
NUMBER 8

BUYER'S GUIDE TO
Portable Computers

FAMILY COMPUTING®

The Mail-Order Buying Boom

**Panasonic's New
PC Compatible:
Business Partner
FX-600**

**Home Office:
Improving Sales**

**How to Succeed
At Moonlighting**

**On Balance: A
Finance Program
For Your Apple**

**Entertainment:
Hints, News &
New Releases**

**Remote-Control
Computing**

**24 AT-A-GLANCE
SOFTWARE REVIEWS**



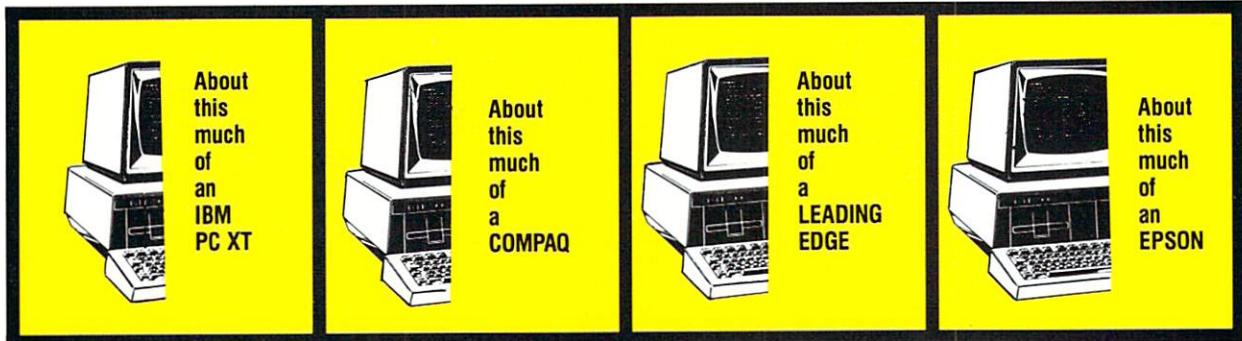
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ORIGINAL PROGRAMS FOR ADAM, APPLE II SERIES & MACINTOSH,
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IBM PC & COMPATIBLES, TANDY COCO, TI-99/4A

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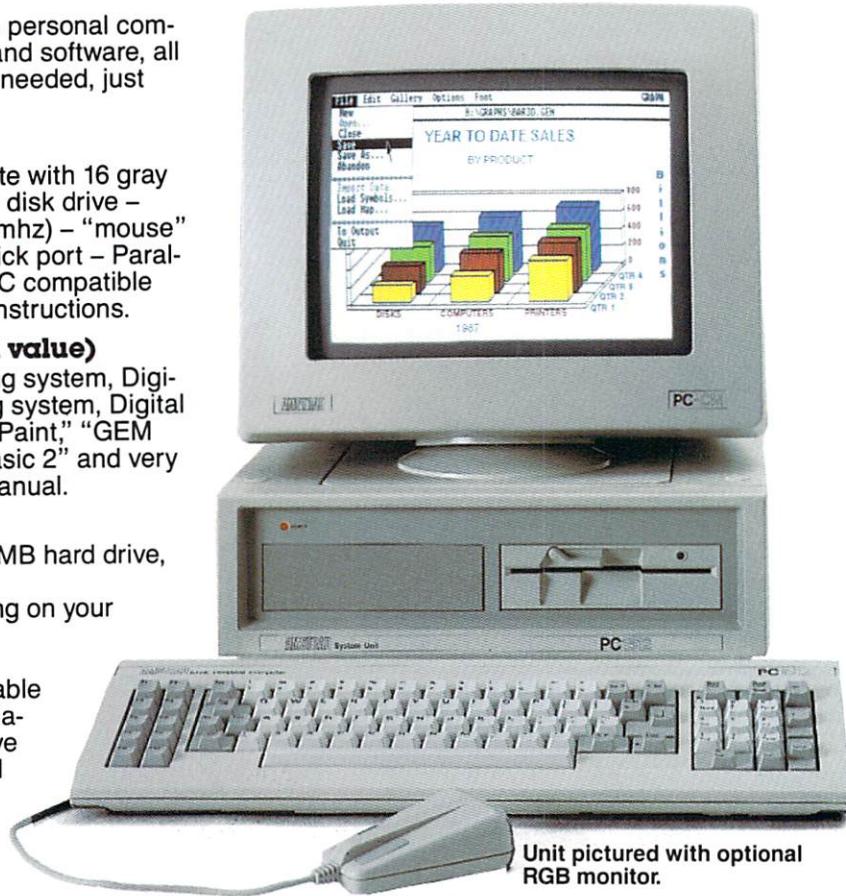
Microsoft MSDOS V3.2 operating system, Digital Research DOS PLUS operating system, Digital Research "GEM Desktop," "GEM Paint," "GEM Doodle," Locomotive Software "Basic 2" and very detailed, clearly presented user manual.

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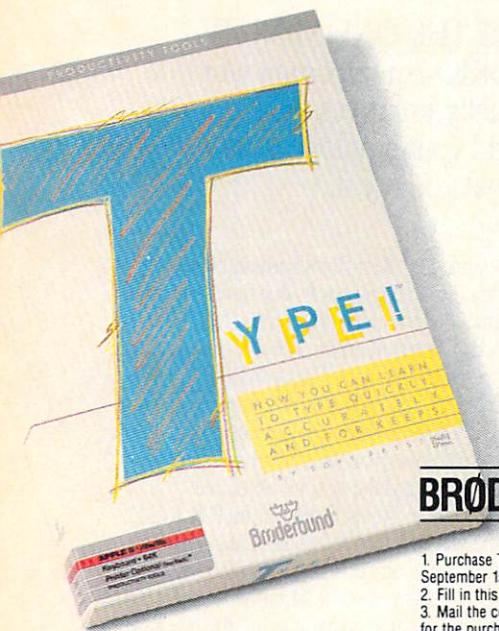
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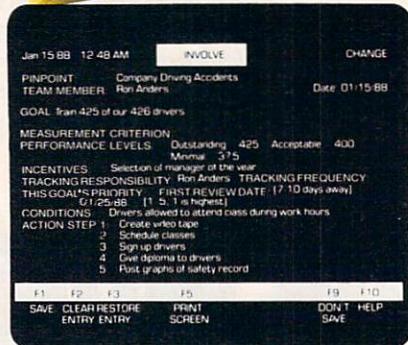
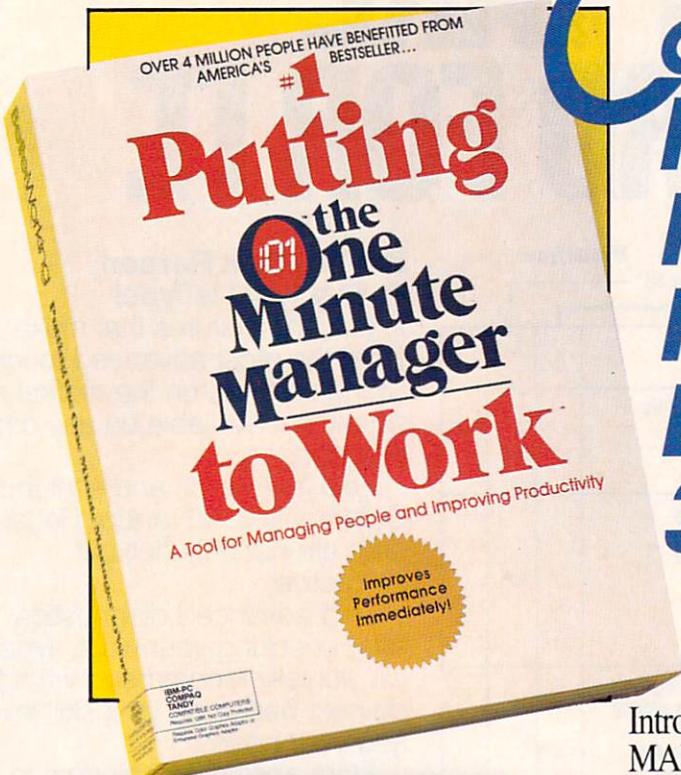
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FAMILY COMPUTING

COVER STORY**29**

THE MAIL-ORDER BUYING BOOM

Enjoy the benefits and avoid the pitfalls of buying computer products through the mail. Includes sidebars on how to place a telephone order; mail-fraud laws; the pros, cons, and legalities of buying on the "gray market"; and a comparison of list, retail, and mail-order prices for 13 products.

HOME OFFICE**6**

COMPUTERS AND SALESPeople

Use your computer to find company information, analyze markets, create effective sales presentations and proposals, service accounts, and—most important—get more orders!

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Running your own moonlighting business may be easier than you think, if you use your computer to help you with filing, marketing, designing, and a host of organizational details. Profiles of four successful professionals who moonlight.

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REIN IN YOUR MONEY WITH ON BALANCE—FOR APPLE IIe/IIc/IIgs

With *On Balance*, Apple owners have a down-to-earth, easy-to-use finance program to maintain accounts, set up budgets, and track tax deductions.

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THE REMOTE-CONTROLLED COMPUTER

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PLUS: REMOTE-HOST SOFTWARE LISTING

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Panasonic's sleek, responsive new IBM-compatible offers XT compatibility and AT speed at a pleasing price.

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Portable computers are smaller, faster, more IBM-compatible, and more versatile than ever. User profiles, plus a Shopper's Tearsheet for 19 leading laptops, notebooks, and uprights.

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Crisscross stellar traffic with your towing craft to aid stalled space taxis. A game for Apple, Commodore, IBM PC & compatibles, and Tandy computers.*

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PUZZLE

This month, *Crossword Puzzler* is presented for Adam, Apple, and Atari computers (*see July issue for Commodore, IBM PC & compatible, and Tandy versions.**)

NEXT MONTH: SOLUTION TO AUGUST PUZZLE, PLUS DATA FOR A NEW PUZZLE

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UTILITY PROGRAM

Use *Reverse Scroller* to change the direction text scrolls on your Apple, Atari, Commodore, or IBM PC or compatible.*

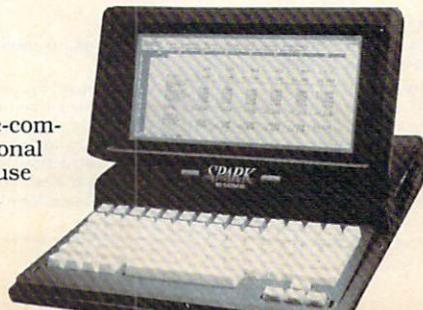
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MICROTONES

Use *Three-Voice Sound Effect* to add rich tones to programs on your Apple, Atari, Commodore, IBM PCjr or compatible, or TI-99/4A computers.*

*See program for specific computer models and hardware requirements.

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CLASSIFIEDS

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COVER PHOTOGRAPH BY DONNELLY MARKS

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EDITOR'S NOTE

THE GREAT EQUALIZER

Two cliches (or two truths): Working with computers, or using them successfully, requires the ability to change; the computer is the great equalizer.

FAMILY COMPUTING is at a point where because the latter is true, so is the former. And this is the issue where more change takes place.

Longtime readers may remember when we published a separate magazine called K-POWER for computer-using kids. When all the magazines for these kids failed because of insufficient advertising support, we incorporated K-POWER into FAMILY COMPUTING as a separate section.

Readers loved it. They sent in their best game-playing tips, entered our contests, and ate up our news about the industry, our music programs, and our gaming strategies.

There were two problems: First, the readers of K-POWER weren't all kids. Where age was requested on contest entries or tips, we came across a lot of relatively big numbers—26, 33, 39, 42, and on up, with even a smattering of double-digit numbers that began with six or seven. Of course, you don't have to be young to enjoy having fun!

Second, some of the nonkids who enjoy game-playing or music programs, or some of the other K-POWER features were put off by a section clearly targeted for kids and passed right over it. I'm sure a lot of them didn't even know what they were missing. In fact, some kids overlooked the section as well.

So, starting with this issue, there is no separate entity called K-POWER. Instead, we've integrated its best and most popular features into the rest of FAMILY COMPUTING.

Our newly expanded Entertainment department (*see page 20*) now opens with news about the industry, such as what to watch for, trends,

and games in development. It also features the tips, hints, and strategies that game-players love. A third and new section of the department announces releases of new machine formats for popular games we've already reviewed. Be sure to let us know how you like this new setup and send us your best tips.

The music programs, which get a lot of response—especially when readers can't get them to work—are now a part of The Programmer (*see page 59*), where they should get even more attention than they did in the past.

Readers of our reviews will notice a new color scheme that allows for more flexibility of categories, a necessity with all the home-business and personal-productivity products coming to market. As more and more computer owners start working at home and as more and more people buy computers for just that purpose, I'm sure there will be even more programs to cover.

That brings up another way in which the computer has turned into a great equalizer. It no longer takes a large corporation to afford powerful technology. With the ever-growing number of computers being put to work at home, our coverage of the home office will continue to grow. You may have noticed the recent change at the top of our cover—FAMILY COMPUTING: For The Home and Home Office. Keep reading and keep watching for change. There's sure to be more in issues to come.



—CLAUDIA COHL
EDITOR-IN-CHIEF

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LETTERS

LAWYER WANTS TO LEARN DOS

I have a solo law practice, and I am at a loss as to how to use MS-DOS or GW-BASIC to full advantage on my Leading Edge Model D computer.

Should I get a book or books, look for an introductory course to computers, or search for computer-based training courses? I have taken a word-processing course to learn PC Write (QuickSoft), and I have the 2.55 version of that program. I also have *Leading Edge Word Processing*, a spelling checker, MS-DOS 3.1, and GW BASIC 3.11.

Any help you could give me would be appreciated.

CASSIUS H. TOON

Charleston, West Virginia

EDITOR'S NOTE: To save time, you might want to consider hiring a consultant or tutor (contact the Independent Computer Consultants Association, [800] GET ICCA, or write P.O. Box 27412, St. Louis, MO 63141); or check with colleges, universities and computer stores in your area for courses.

If you want to go it alone, Microsoft publishes an excellent interactive disk-based guide called Learning DOS (1986; \$49.95). Among the hundreds of useful books on the subject is Running MS-DOS by Van Wolverton (Microsoft Press, 1984; \$21.95). For books on GW-BASIC, browse the computer section of your local bookstore.

BRAND-LOYAL READER

Thank you for your mention of the Kaypro PC in your June issue. To say that computer owners are brand-loyal is something of an understatement; some of us are what may be termed fiercely so.

One prime reason is that in this throwaway world, products that are sloppily made and quickly fall apart are the norm. It is gratifying to encounter a well-made product that will perform as advertised.

My Kaypro II, my Sony VCR, and my Bronco II are three items I own that rank among those too-exceptional examples.

All too often, well-made products are passed over unless they send up parachute flares, feature spinning, smoking and sparkling pinwheels,

or sing "Smoke Gets In Your Eyes" in Kurdish. Thanks again for noticing the Kaypro.

WILLIAM D. LIVINGSTON
Colorado Springs, Colorado

RAVE REVIEWS

It was a fantastic idea for you to publish a complete special issue full of software reviews. Just recently, I was trying to find back issues of FAMILY COMPUTING for software reviews.

I feel your magazine is very helpful for home business and educational users. The articles are written in understandable terms, and the information in them continues to be relevant as general computer knowledge increases.

PHYLLIS HOEFT
Morton, Illinois

I am interested in buying some software, but I would like to read some of your published reviews first, particularly of Karate Champ and Summer Games II.

Where can I find these reviews?

MARK J. BROWN
Chicago, Illinois

EDITOR'S NOTE: Thank you for your letters. Readers who would like a copy of this premier special issue (which includes a review of Karate Champ) should look for the FAMILY COMPUTING Software Review (\$3.95) on newsstands through August 12 or write to: FAMILY COMPUTING, Annual Software Review, 2931 E. McCarty St., P.O. Box 8088, Jefferson City, MO 65102-9966. Enclose \$3.95 plus \$1 for shipping and allow four to six weeks for delivery.

INQUIRIES SHOW INACCURACY

I was delighted to be a part of Lynne Arden's article, "Top 10 Computer-Based Home Businesses," in your June issue. I was also pleased to see *The Information Broker's Handbook: How to Profit From the Information Age* listed as a resource.

The price of the book is \$24.95, as listed, but there is an additional \$2 charge for shipping and handling. In addition, Texas residents must add \$1.81 in sales tax. Checks should be made payable to Response Time, not to Ferret Press.

Again, the address is: Response Time, Suite 0-69, 314 MacArthur Commons, Irving, TX 75062. Those using a VISA or MasterCard should include the account number and expiration date.

JOHN H. EVERETT
Irving, Texas

ENCOURAGEMENT FOR HOMEWORKERS

Michael C. Thomsett's article, "Starting Your Own Home Business," contains some excellent advice, but I disagree with him on one important point. Early in the article he states, "You can do it, if you're willing to pay the price . . . possibly less money than you make as an employee."

This statement is extremely misleading, especially for women, who make \$.64 for each dollar a man makes for the same work. That's only an average across the board, however. The gap is larger at the low end of the spectrum, in the "pink-collar ghettos."

I interviewed over thirty women who started computer-based businesses at home for my book, *The Woman's Work-at-Home Handbook: Income and Independence with a Computer* (Bantam, 1986; \$9.95), and most of them told me they had doubled their income for the same work they were doing as employees.

You must research your market thoroughly, and your findings must factor in your business decisions. But I fear that many people may be discouraged by Thomsett's remark, and that's a shame, because there's no need for them to be.

PATRICIA McCONNELL
Moab, Utah

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HOME OFFICE

COMPUTERS AND SALESPeOPLE

Tools to Keep You Ahead of the Competition

BY STEPHEN MILLER

There are two kinds of salespeople—those who use computers and those who don't. Those who do make more sales contacts, are more convincing in their presentations, and probably make more money. Those who don't, don't. It's that simple, and integrating a computer into your sales work can be pretty simple, too.

Selling any product or service is a dynamic process that has several, often overlapping, components. The cycle can be divided roughly into eight parts: The first two are identifying the market (what people or businesses might buy from you) and identifying the territory (local, regional, national, or international). The next two parts are analytical: finding potential and existing customers and then determining their needs. Parts five and six consist of making the sales presentation, followed by a proposal based on specific feedback garnered during the presentation. The last two parts are the most fundamental—getting the order and servicing the account.

The consistent element in all phases of the sales process is the need to access information. You need information to answer all the questions that are raised as you move toward completing a transaction. What is the market for your product? Where are the customers? What's the best way to reach them? What's the possibility of repeat business? For the home-based or small business, not having answers to these questions can put severe limitations on growth or even survival. You need some means of getting the proper marketing information and arranging it in a form that can maximize your limited resources.

While there are a few software packages designed specifically for salespeople, these programs are limited because different types of sales demand different functions. For example, there's a program specifically for advertising salespeople called *SpaceBASE* (Stadis Corporation,

STEPHEN MILLER writes the Tandy column for FAMILY COMPUTING's "Machine Specifics" department.

F1: Help	F2: Menu	Browse	1 Record
First Name	John	Last Name	Sterling
Nickname	Big John	Agent's Number	232314
Office Address	567 Powell St.	Office State	CA
Office City	San Francisco	Office Zip	94104
Office Phone #1	(415) 623-1200	Mobile Phone	(415) 490-9000
Office Phone #2	(415) 623-1202		
Secretary's Name	Alice Kirsten		
Spouse's Name	Joan	Spouse's Nickname	none
Home Address	5 Redwood Road		
Home City	San Anselmo		
Home State	CA	Home Zip	94149
Home Phone #1	(415) 223-6756	Home Phone #2	(415) 223-4552
Date of Birth (DOB)	4/23/51	Spouse's DOB	11/02/50
Activities	Charter Life Underwriter		
Hobbies	Golf, tennis, sailing		
Spouse's Hobbies	Tennis		
Religion	Methodist		
Child #1	Michelle	Child #1 DOB	6/18/77
Child #2	John Jr.	Child #2 DOB	12/25/79

— Find — Add — Modify — Remove — Sort — Output — Layout — Define

A database helps insurance broker George Ware track agents who sell his policies. He lists information about their office addresses and phone numbers, for instance, in green; purple is used with the same data for their home lives. He also tracks their families' birth dates to remind him when to send birthday cards.

[214] 991-0010). Fortunately, considering the variety of sales techniques, almost any productivity program can assist you in selling your product or service. Word processors, databases, spreadsheets, communications, and "notepad" software can all be used creatively to help you sell.

ON THE CUTTING EDGE OF TECHNOLOGY

Mel Corbett isn't on the road anymore, but he's sold everything from men's clothing to sporting goods. He's worked for companies with large, well-supported sales forces, and he's worked independently—out of the trunk of his car. Now Corbett operates a real-estate management company that specializes in smaller buildings. He uses personal computers in all the management aspects and recently purchased a Toshiba 3100 portable for work at home. He said he discovered that it's also a great addition to his sales effort when he makes presentations. Because his clients tend to be inexperienced in maintaining and managing their property, they have a lot of questions to ask.

"I can show potential clients how we manage their property and the

kinds of reports they can expect," Corbett explained. "I can call up a Lotus 1-2-3 spreadsheet and quickly show them the real costs of using our service as opposed to doing it themselves. Lotus 1-2-3 will also let me present the figures graphically. That usually impresses them."

Corbett said that just having the computer is a big sales plus; clients like the fact that all his records are computerized. He believes that people feel safer with a company that seems to be on the cutting edge of technology. At a recent trade show, he set up the office system in his booth. "Even though the only thing on the screen was a sample spreadsheet, people stopped and stared at it," he said. "None of the other management firms had a computer there, so we stood out. We got several good leads because of it."

INSURING SALES SUCCESS

Insurance broker George Ware swears by database software as the key to developing and keeping new business. Ware's sales technique is geared toward direct marketing. He contacts independent insurance agents and offers them the various policies available from the seven

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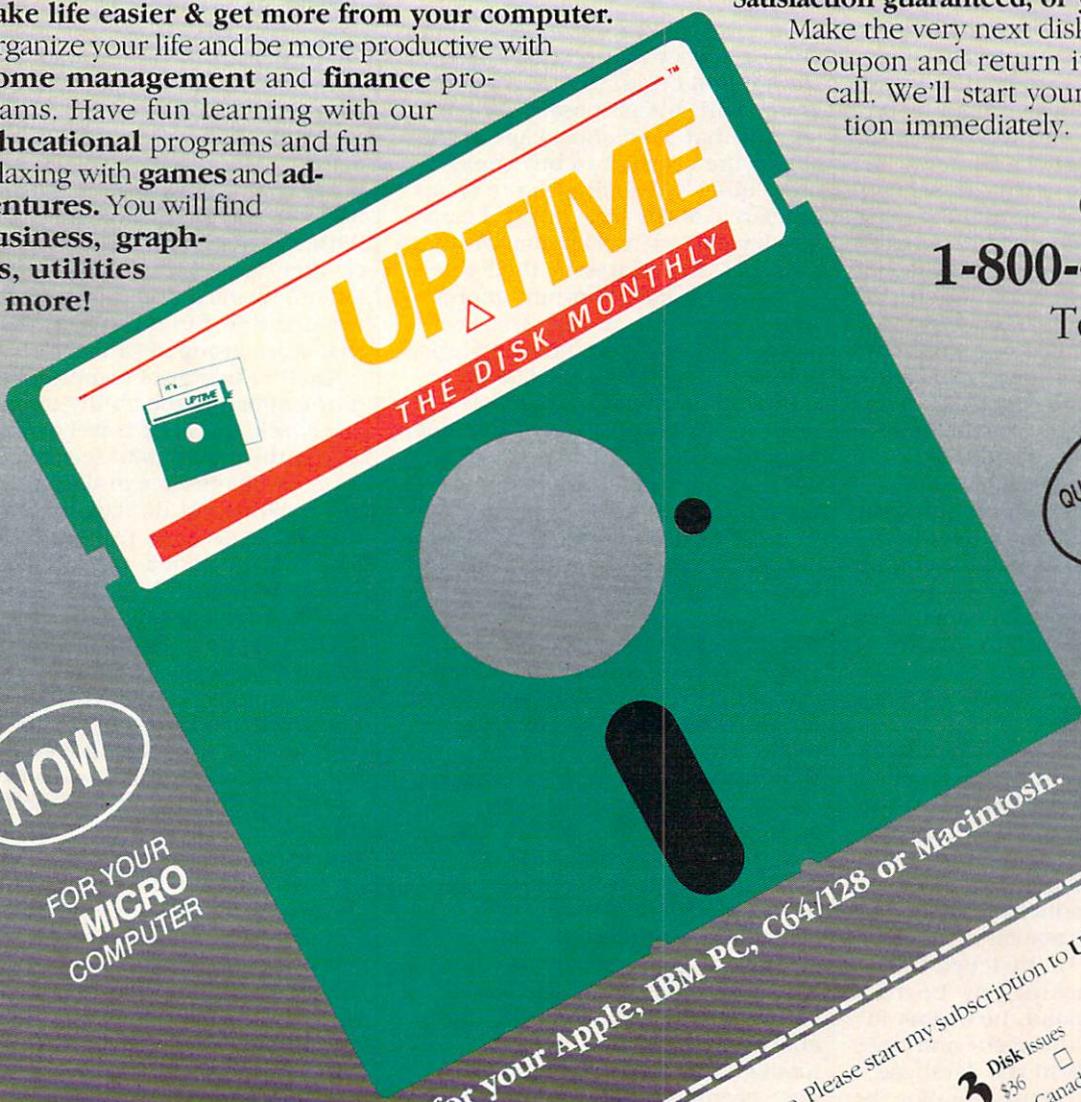
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small insurance companies he represents. Working from his Burleson, Texas home, Ware services 2,300 agents in six states. At first glance, it would appear that sophisticated mass-mailing software would be required to handle the volume of work that Ware generates. The records he keeps on his customers include everything from the kind of policies they've sold through him to the commissions they've earned. Ware has one database file that contains nearly 95,000 entries.

He stresses that while his operation is extensive, it's something that anyone can do because of the simplicity of the software he uses. He's tried several database programs on his two IBM PCs, but has settled on Nutshell from Nashoba Systems (see review in "Software Guide" section). Nutshell is not a relational database like dBase III Plus or R Base System V, but Ware says it's very flexible and easy to use. How he uses it is what makes it such an effective tool.

Ware has put together an unorthodox sales campaign that takes advantage of the computer's ability to produce mail-merged documents using a word processor and a database. He uses the *Leading Edge Word Processor* in conjunction with Nutshell. The standard direct marketing sales technique is to send potential clients professionally designed, typeset four-color brochures. The expected response to this type of mailing is 1 to 2 percent of the potential clients. Ware claims a 6-percent response rate.

Ware's twist on the normal direct campaign is to print his pitch (concerning a new type of policy) on the face of the envelope and put the address on a label on the flap side. Inside, he inserts a standard reply card. This nontraditional approach earns him a high response rate because people are so intrigued that they write back asking how he did it. Once they respond, he begins to build a profile of the agent and the individual's needs in the database. This allows him to custom-tailor the next mailing so the response to his products stays high.

PICTURE THIS: VISUALS AS SALES TOOLS

Security consultant Arthur Burton's bottleneck in the sales process is with potential clients who don't fully understand state-of-the-art security systems. He found that it took

several visits before all the questions were finally answered and the deal closed. Those repeat visits consumed time that could have been spent pitching other accounts. He noticed that a recurring question concerned where the system would be installed and how it would affect the look of the client's respective home or office. "The detailed, five-page narrative never seemed to be enough," said Burton. "If they could see the way it would look beforehand, it would cut down on the time it took to make a decision."

To solve that problem, Burton purchased a drawing program called *Dr. Halo II* and began to furnish diagrams with his proposals. "When I submit that kind of package to the client, the decision to buy comes more quickly. People seem to be appreciative of the fact that you can quickly give them a custom-designed proposal that addresses their concerns and needs. They are impressed that you are able to turn their concerns into a diagram showing exactly how the installation will look."

Burton believes that the visual element in his proposals sets him apart from his competitors. "It says that not only am I in a high-tech business, but that I use the technology in every respect, even down to the simple matter of the sales presentation," he concluded.

SALESPEOPLE ON-LINE

Burton's system also includes a modem. Through a database service for security specialists, he uses his modem to search for information that keeps him abreast of the latest trends. "Being aware of changes in equipment and new techniques can aid in selling a system," he explained, "and it keeps me ahead of my competition."

Electronic communications is an element of the sales process that's just beginning to be appreciated. According to Corbett, "If I had known about all the services available via modem, my life on the road would have been a joy." He said that being able to obtain market data on a particular city or industry would have given him a further edge in focusing his sales efforts. "I knew that there was all that information available but I never had the time or staff support to find it," he said. For example, there are database services especially geared to the real-estate industry. Instead of going to the Hall

of Records and poring over dusty titles, a realtor can call the service and specify what he's looking for and, if it's in the database, have it sent to his system in minutes.

The U.S. government runs several free or inexpensive databases that can provide the salesperson with all kinds of useful information to determine where to concentrate his or her efforts. The U.S. Department of Commerce has a 24-hour Economic Bulletin Board system that offers everything from unemployment figures to long-range economic forecasts. This BBS is open to the public; initially, you can browse for free, with only a small service charge for regular users. You can log on at 300, 1200, or 2400 baud at (202) 377-3870.

Telecommunications is particularly handy for salespeople on the road. With a modem and portable computer, they can call the office to upload letters, memos, and purchase orders; or they can download files on that day's group of prospects.

Another aspect of computer communications is the ability to personally check and alter travel arrangements through database services such as The Source and Compu-Serve. While not directly involved in the selling process, this aspect could have a tremendous impact upon it. Travel delays can limit the number of calls a salesperson can make.

The telephone is the lifeline of most salespeople. Keeping track of phone numbers, contacts, or product needs can be a nightmare whether the salesperson travels or not. Salespeople might want to use one of the desk organizers such as SideKick (Borland International), which not only allows you to keep an extensive phone list, but also dials the phone for you. These types of "pop-up" programs usually have notepad features which let you keep the kind of information on customers that make them feel special. You could note the names of their spouses and children, their favorite leisure activity, and so on. Having that information at the press of a key can sometimes make the difference between making and not making a sale.

Every independent salesperson looks for that edge that will result in increased sales. With the proper appreciation of the computer's ability to act as sales assistant, that edge can be maintained and enhanced. 

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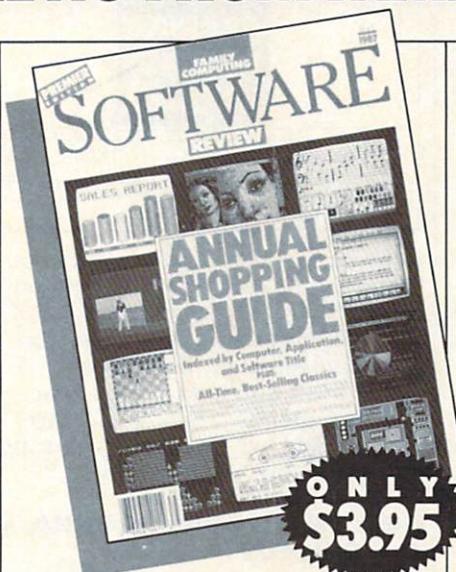
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PERSONAL FINANCE

Rein in Your Money with On Balance For Apple IIe/IIc/IIgs

BY LINDA WILLIAMS

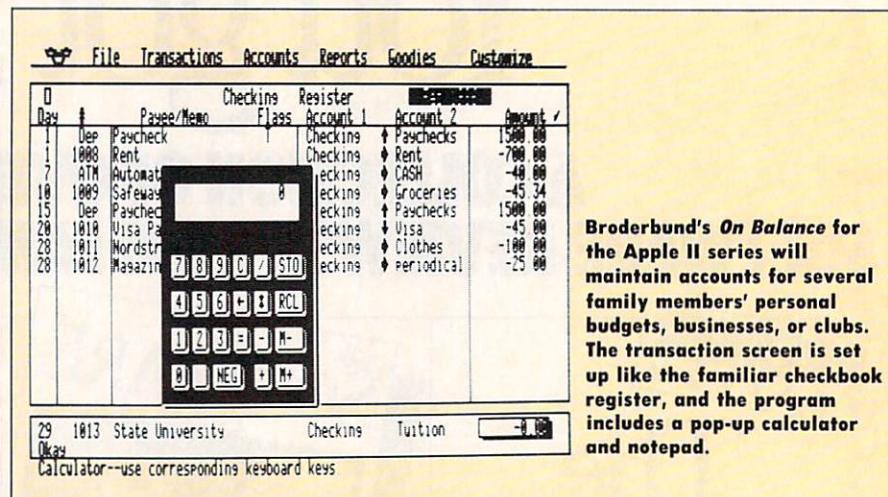
The last time I saw Vicky—who owns a horse-racing business in Silicon Valley—was in March. She was sitting on her living room floor, surrounded by mounds of receipts, canceled checks, and bank statements. Her husband, Dan, kept watch close by, one eye on the TV, the other on the family's labrador, who longed to play in the piles of paper. Surveying the annual tax-time paperwork, Vicky said, "There must be an easier way."

There is, and it begins with a computer and sensible personal-finance software. With a computer, like the Apple IIe, IIc, or IIgs, and a program like *On Balance* (Broderbund, 17 Paul Drive, San Rafael, CA 94903; [415] 479-1185; \$100), Vicky could trot right through her taxes. Vicky need spend only a few hours each month entering savings-account and checking-account transactions, stock and bond sales or purchases, and home or home-office expenditures to rein in her finances. With the stored information, Vicky could use *On Balance* to determine her net worth, graph her earnings on a month-to-month basis, figure out whether or not her spendings are in line with her budget, list her tax-deductible purchases, and do much more.

AN ANSWER TO YOUR FINANCIAL "WHOAS"

Like most software of this breed, how well it runs depends on what and how you feed it. As you record transactions each month, you must assign each to a category: INCOME for payments received; EXPENSES for payments made and taxes paid; LIABILITIES for unpaid credit-card balances and outstanding loans; and ASSETS for deposits—to name a few.

The accompanying 112-page manual makes everything clear. It includes an essential primer of accounting terms and principles of home finance, step-by-step instruc-



Broderbund's *On Balance* for the Apple II series will maintain accounts for several family members' personal budgets, businesses, or clubs. The transaction screen is set up like the familiar checkbook register, and the program includes a pop-up calculator and notepad.

tions for using and tailoring the program, examples of transactions you might enter, and representations of how various steps might appear on screen. If you read the manual before beginning and keep it near the computer as a handy reference, you should have no problem figuring out how to use the program.

HOW TO GIVE THE PROGRAM A WORKOUT

You start by creating a database report for each month, and since each data disk will hold only 12 months' worth of information, it's best to organize by calendar or fiscal year. Then, you enter each transaction.

After you've entered a month's worth of transactions, you can view the accounts in an organized fashion. You can call up a listing of all your ASSETS (cash, IRAs, and stock, for example) and their total worth; your LIABILITIES (such as the amount owed on loans or credit cards); your INCOME for that month; and your EXPENSES. It's a simple way to get a clear picture of where your money goes.

When you have entered several months of data, the reports you create can become even more complex. For instance, if you indicate that you want to see your INCOME, the program will show you a bar graph, representing the amount you earned each month. If you request to

look at your budget, you might find that in December you were 35 percent over your allocated expenditures, but that in October, you were 40 percent below. With that information, you could plan better for next year.

One of the program's many frills is a pop-up calculator, which is superimposed on the screen. It looks like the real thing, and when you depress a number on the computer keyboard, the cursor indicates the corresponding key on the screen image. Another useful feature is a link to *AppleWorks*, which allows you to create spreadsheets with the information you've stored.

On Balance does have a few limitations. For instance, some of the tax-related information in the manual is outdated because of recent changes in the tax law (for example, credit-card interest charges are not fully tax deductible in 1987.) And like other personal-finance programs, *On Balance* takes time to set up and requires maintenance. People with uncomplicated finances—those who can find out where their money goes and how much they're worth by looking at one bank statement—might find that a computerized balance sheet requires more time than it's worth. Nevertheless, the easy-to-use program should be able to help most Apple owners make sense out of their finances. ☐

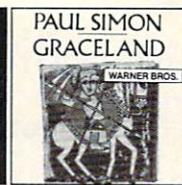
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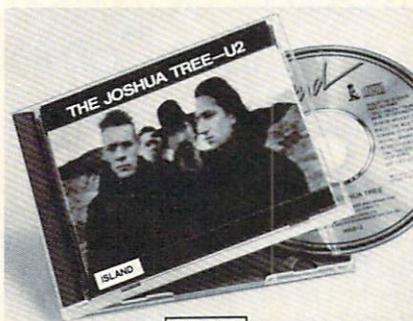
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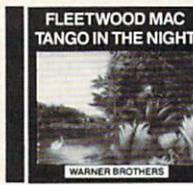
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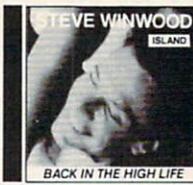
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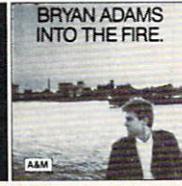
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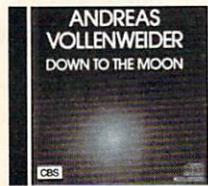
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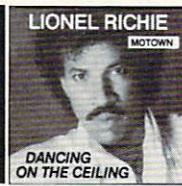
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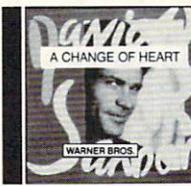
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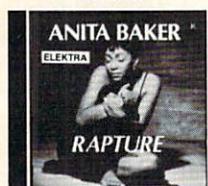
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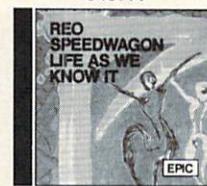
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349324. South Pacific.
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347153. Cyndi Lauper—
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353516. George
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TELECOMPUTING

THE REMOTE-CONTROLLED COMPUTER

With the Right Software, Your Computer Will Take Calls And Run Software When You're Not There

BY RIC MANNING

John Newby calls Lexington, Kentucky, home, even though he's out of town as often as he's in.

As director of international operations in combustion engineering for North American Manufacturing Co. in Cleveland, Newby travels around the world helping customers build sophisticated furnaces.

But no matter where he travels, Newby is never far away from the IBM PC AT at his home or the Hewlett-Packard mainframe at his company's headquarters.

When Newby travels, he takes along a Tandy Model 100 portable computer that lets him communicate with either computer from any telephone—even when there's nobody at the other end.

With the portable, Newby says he can answer his mail, check billing data for his customers, run statistical calculations, or upload reports for the office staff to work on while he's away. "I couldn't operate without it," he says.

When he's at home in Lexington, Newby uses the AT, equipped with a modem and communications software, to connect directly to the Cleveland mainframe that is 300 miles away. Except for the modem's speed limitations, Newby says the AT lets him do anything people in the Cleveland office can do.

RIC MANNING edits *Bulletin Board Systems* (11 Ferry Lane West, Westport, CT 06880), a newsletter about telecommunications. He welcomes electronic mail on *The Source* (ID: ST9007) and *CompuServe* (ID: 72715.210).

Like Newby, a lot of people are discovering that one computer just isn't enough. Sometimes you need one at the office, another at home, and maybe one to take on the road. And then there are those times when you'd like to access the mainframe behemoth—whether across the continent or at your nearby company headquarters.

MAKING CONNECTIONS

Getting one computer to chat with another can be as difficult as getting Reagan and Gorbachev to sit down over a couple of beers—especially if the computers include a microcomputer that is used to access a mainframe. But it can be done, if both sides are properly equipped. Here's a quick checklist of what you need to make calls to an unattended computer.

The modems on either end usually don't have to be the same brand, but that wouldn't hurt. They don't have to be Hayes compatible, but since Hayes is the industry standard, that couldn't hurt either. The modem that will receive your call must have an AUTO ANSWER feature, because you want it to answer your call by itself if it's unattended. And keep in mind that the slowest modem sets the pace; if one modem operates at 300 baud (as Newby's Model 100 does), it doesn't matter how fast the modem on the other end of the line can communicate.

Once you make a modem-to-modem connection, you want clean transmission of data, without gar-

bage. And not all telephone lines are created equal. A call on some of the discount networks can go bouncing from copper wire to microwave to fiber-optic cable and back to wire, picking up all sorts of "dirt" along the way. If possible, try to use a system that specializes in data transmission. Telenet's PC Pursuit service ([800] 835-3638), for example, will connect you to computers in 25 major cities. You simply dial a local Telenet number, and the system sends your data winging across the wires.

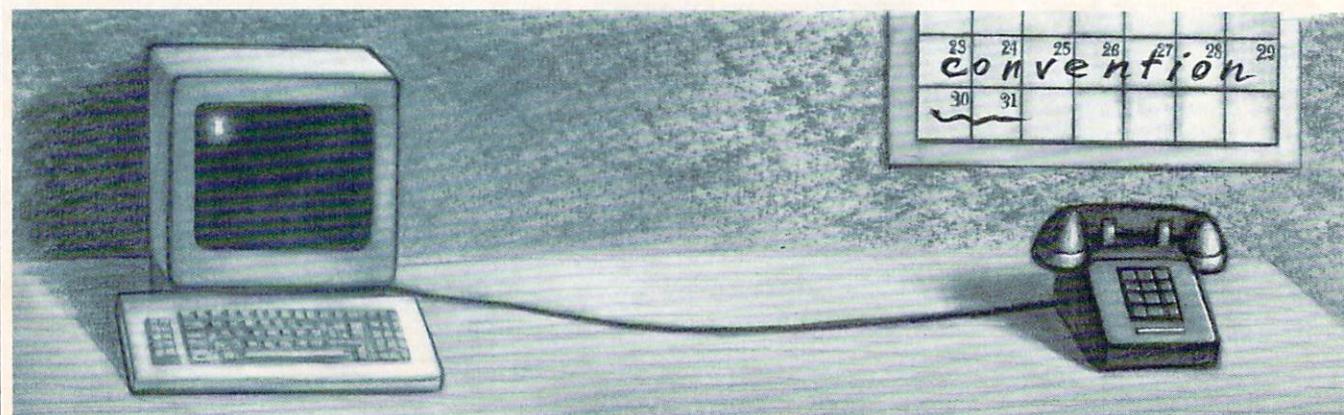
For all these hardware mechanics, it's with the software that the rubber meets the road. Communications software sets the ground rules, establishes the language of digital discourse, and keeps the conversation on track.

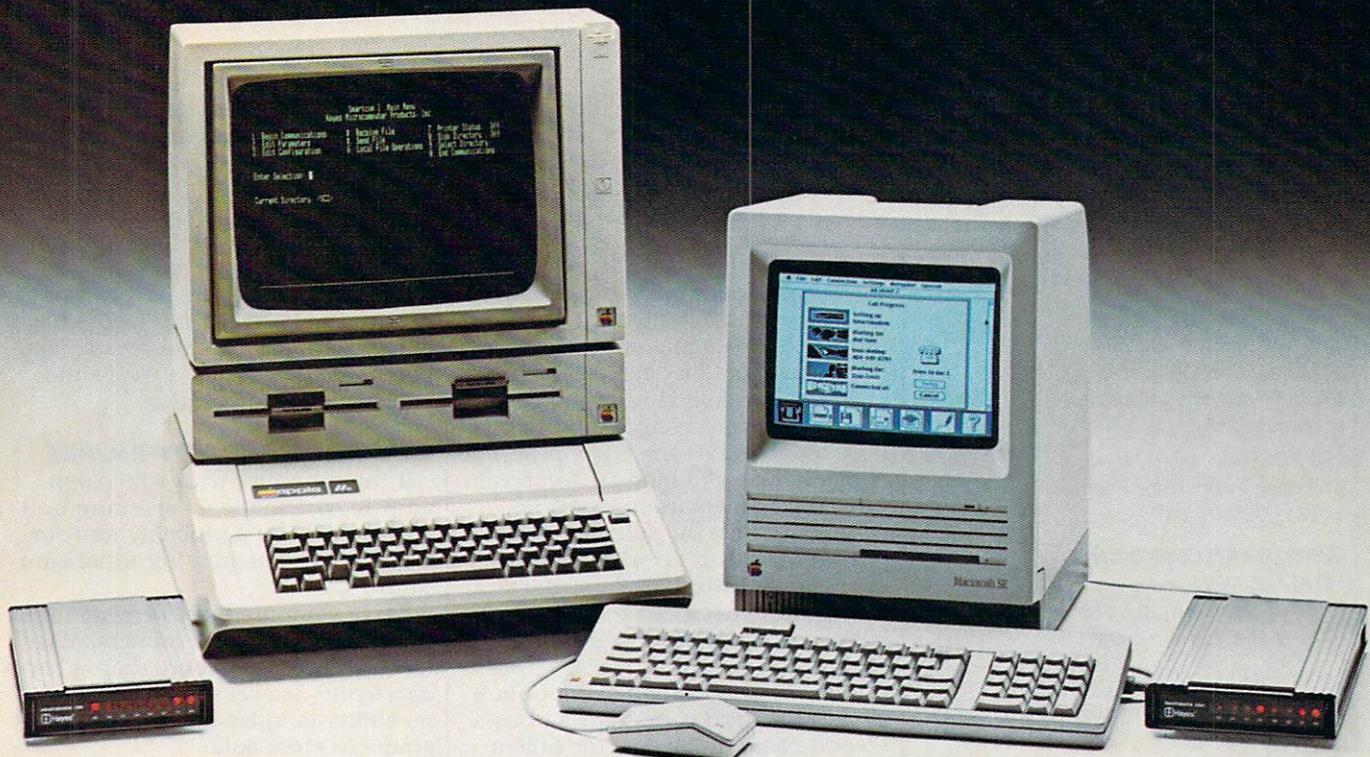
The first step is to set the same parameters on both ends. The setting used by most bulletin boards and users—8 data bits, 1 stop bit, and no parity—will do fine. The important thing is to make the same adjustment on each end.

And, like the AUTO ANSWER modem, the software on the receiving end needs to have AUTO ANSWER capability as well, in order to answer the phone when your call comes. When it does, the two machines will exchange warm carrier tones; then, you're ready for business.

UNATTENDED OPERATION

What happens next also depends on the software. Almost any package will let you carry on a conversation

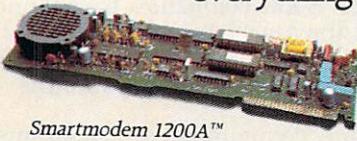




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Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.



Hayes.

TELECOMPUTING

REMOTE-HOST SOFTWARE

Here's a list of some popular communications software that allows your computer to answer incoming calls by itself (with a remote host feature) and works with mainframes (with a terminal emulation feature).

APPLE IIe/IIGS

ASCII EXPRESS MOUSETALK,
ASCII EXPRESS PRO
United Software Industries
(818) 887-5800
PFS:ACCESS
Software Publishing Corp.
(415) 962-8910

APPLE MACINTOSH

SMARTCOM II
Hayes Microcomputer Products
(404) 449-8791

TELESCAPE

Mainstay Software Inc. (818) 991-6540

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Persoft Inc. (6-8) 273-6000

SMARTCOM II
Hayes Microcomputer Products
(404) 449-8791

TANDY 1000, COCO

DESKMATE II, 3
Tandy Corp. (817) 390-3700

with a person at the remote keyboard. But if you want to fiddle with files and programs by yourself, you need software with a REMOTE or HOST setting. When Newby's AT is set in REMOTE mode, for instance, he can use his portable to call it, even though no one is operating the AT. Of course, the remote computer must be turned on and set up properly—that can't be done from afar.

A number of good communications software packages offer remote host capabilities (*see accompanying "Remote-Host Software"*). To prevent unwanted callers from accessing your computer, the software has a password system for which you choose a password. Callers who clear a password check can read and leave messages and upload or download files.

Some software, such as *ProComm* (for IBM PC and compatibles), has a second password screen for callers who want access to the host computer's operating system. With such a system, you can give some people clearance to swap files and leave messages—but impose tighter restrictions as to who can access the operating system.

RUN SOFTWARE FROM AFAR

Once you obtain access to the operating system, the host computer acts as if you're sitting at its own keyboard. For the most part, commands and programs will work the same as if you were sitting there—so you can actually run applications programs from afar.

There are, however, a couple of exceptions. First, the computer you're calling from must have the same display capabilities and basic keyboard structure as the host computer. Thus, the Model 100, with a 40-character display, wouldn't work with much software, but a number of other portables would (*see "Buyer's Guide To Portable Computers" in this issue*).

Second, the responses will be slower. You'll be limited by the speed of the modems that connect the two computers and by any phone-line factors that might slow the transmission.

The third problem area is in graphics. IBM programs that require color graphics, for instance, can't be controlled from afar. And other programs that frequently redraw the screen will be slow or may not work

at all. Thus, spreadsheets and word processors may work just fine by remote control, but a graphic game like *Jet* won't get off the ground.

Finally, the host computer must have enough memory to hold both the communications software and the applications program you want to run. In short, while it's possible to run programs from a remote computer, the procedure is tricky and requires experimentation.

TALKING TO MAINFRAMES

If the computer with which you want to communicate is a mini or a mainframe, you'll probably want to try another approach: terminal emulation.

Large computers are designed to work with multiple terminals. Most terminals are little more than a keyboard and display screen and have no ability to independently run programs or store data.

The trick is to fool the mainframe into thinking your computer is just another terminal. To do that, you essentially spend time and money to bypass the features that make your box a computer in the first place.

A good software package will ease that chore through a process called *emulation*. An emulation routine fools a micro into thinking it's a terminal for a big IBM or Digital computer. Some companies have found that the Atari STs make dandy terminals, because they have terminal-emulation software built into the machine.

Many communications programs include emulation as an option. Three of the more popular emulation protocols are the IBM 3270, DEC VT100, and DEC VT52 standards. If your communications program is able to emulate a terminal protocol, it will be listed as a configuration option.

If you configure your system properly, you may be able to use it to communicate with computers at your home and corporate offices—even if no one's there to answer the phone. John Newby does. 

ELECTRONIC EDITION

The FAMILY COMPUTING Forum on CompuServe (GO FAMFORUM) is a meeting place for the magazine's editors and readers. The Forum's libraries have software reviews and programs from the magazine that can be read online or downloaded.



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HOME-SCHOOL CONNECTION

COMPUTERS ON CAMPUS

Should You Bring, Buy, or Borrow? It All Depends . . .

BY ANN E. LAFORGE

During his senior year of high school, John Curran, of Westfield, Massachusetts, had college on his mind. He had been accepted by three schools, was waiting to hear from a fourth, and was toying with the idea of majoring in engineering. And like many other college-bound students, he was wondering what to do about a computer: bring one? buy one? plan to share?

None of the colleges to which Curran had applied required or advised him to have a computer, but he was certain—based on his experience with word processing—that one would come in handy. His brother, Bill, who used a Zenith Z-100 while he was at Clarkson University in Potsdam, New York, was also enthusiastic about the idea. A 1986 electrical engineering graduate, Bill had used his computer to write papers, complete class assignments, and assemble his resume. "A computer can make college work a lot easier to handle," he had told John.

Kimberly Campbell, a 1986 graduate of Dartmouth College, agrees. She bought a Macintosh during her junior year and found that heavy college work loads were suddenly a lot easier to manage. "As a double major in English and government, I was always writing papers," she says. "I thought a computer would be a great time-saver and make me a better organizer."

Not only did it accomplish these two goals, but Campbell's Macintosh enabled her to improve her grades from the B+/A- level to the straight-A level; allowed her to network with other students, professors, and the campus library at all hours; and helped her manipulate statistical data and graphs for complicated research papers. During her senior year, she discovered that it made preparing law school applications a lot easier.

Now a student at New York Law School, Campbell finds her



Bill Curran (right) advised his younger brother, John, to keep a computer in his dorm room.

computer to be an even more essential tool. She explains, "In law school, they don't accept papers with typos and correction fluid. Consequently, the students in my class who don't have computers have to go home two days before an assignment is due and start typing; I'm able to produce professional-looking papers at the flick of a switch."

Bill Curran and Kim Campbell are not alone in their praise for campus computing. "A computer can help with almost every course of study," says Daniel Updegrove, vice president of EDU COM, a nonprofit consortium of colleges and universities that promotes the use of information technology on campus. "If a student is writing a lot of papers, being able to word process is a bonus," he explains. "If he or she is studying technical subjects, the ability to do programming is a definite plus; and if the person is a business major, having a computer with spreadsheet capability is a big help."

DON'T LEAVE HOME WITHOUT ONE?

The belief that computers can help college students doesn't necessarily mean that every undergraduate must have his or her own machine. Indeed, only about 17 colleges, including Drew University, Clarkson University, and West Point, require students to have computers, according to a recent report from the Chronicle of Higher Education.

Another handful—Dartmouth and Lehigh University, for instance—strongly suggest that first-year students bring or buy a computer that's compatible with an intracampus network. The remainder of the institutions have no policies.

With tuition costs already astronomical, adding an extra \$2,000 to the college bill for computer equipment is no trivial undertaking. If your child plans to attend a school that requires him or her to own a particular computer, its cost will probably be included in the total bill, and any financial aid will take the computer expense into account. If your child chooses a college that strongly suggests a certain kind of computer, he or she will have the option to buy or not buy. The school will indicate in advance what to buy and when to buy it, and your family may be offered low-interest loans, special discounts, and again, financial aid.

If your college-bound teenager is in a situation similar to John Curran's—where the college sets no specific computer requirements or policies—you and your child will have to decide whether to use the family computer, buy one, borrow a roommate's, or do without.

ASK QUESTIONS

Before you decide what to do, talk to someone in either the college's admissions office or the academic (or instructional) computing center to

ANN E. LAFORGE wrote "Parlez Français . . . With Your Computer" in the May issue.

The standard equipment on a Laser 128 is optional on most computers

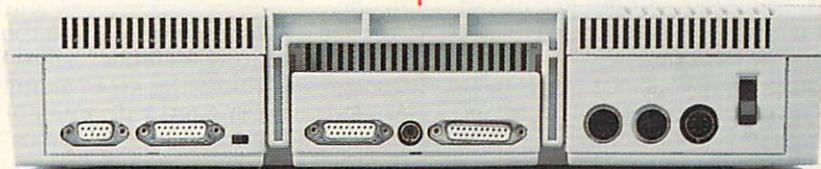


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HOME-SCHOOL CONNECTION

find out how computers are being used on campus. Don't rely on the college catalog for this information. Use the following questions as a guideline:

Is the college committed to a particular brand of computer? This question is important because the answer will clue you in as to whether or not a computer presently used at home or one you plan to buy is a good choice. If the school has no specific computer policy or campus network, relinquishing a computer which your child has used at home and feels comfortable with could be a good idea. If, however, the school has made a commitment to a particular brand that is not compatible with yours, using one your family already has may not be the best option. Nor would buying just any brand.

"It would be absolute madness to buy a computer without getting an idea of what the campus is committed to," says Updegrove. "If the college strongly suggests a Macintosh and your child brings a TRS-80 or Commodore, for instance, it will be harder to turn in assignments on disk. The more a campus supports one machine, the harder it is to be deviant."

According to Updegrove, most major universities support IBM compatibles and/or Macintoshes. However, "the smaller the school, the more likely it is to support only one type," he adds.

Do the courses your child plans to take require computer use? What your child majors in will have a bearing on how often he or she will need the computer and whether or not he or she can get by with borrowing and using a campus computer.

"Ask about how people in your child's intended course of study are using computers," advises Dr. Robert Lutz, director of computing and telecommunications for Drake University. "Journalism and mass-communications majors may be using computers in every class they take, while an artist interested in sculpting may use one only now and then. Also, find out what the faculty members are doing with computers. Do they rely on them heavily in class? Do they assign homework that requires you to use them?"

Be aware that no matter what the major, some required courses may

involve computer work. For example, at Drake, where there is currently no computer purchase policy and only about 350 of 3,000 students have their own machines, first-year students taking English and chemistry courses must use the computer to complete some of their assignments.

If your child is like most entering college students—uncertain of his or her major—try to wait before buying a computer. A machine that's perfect for a business major may not be the best one for a science or art student. A computer purchased during the first year might not be of much use after a major is declared.

How accessible are the public campus computers? This is a key question if you either can't afford to buy a computer or don't want to. You need to make sure that if your child enrolls in courses that require computer use, he or she will have access to one.

"Take a campus tour and see the public computing facilities," advises Updegrove. "Study the area carefully. Are kids camping out with knapsacks waiting to use the terminals? I've been on some campuses where people are routinely lined up to do papers, and I've been on others where 25 percent of the machines are always unused. There's usually an end-of-the-semester crunch, but if the school has a ratio of one terminal for every eight students, that's a good sign."

When you're inspecting computer facilities, also keep an eye peeled for printers. If there are sufficient printers on campus, your child may not need his or her own, Dr. Lutz points out.

And students who have decided to bring their computers with them—no matter what college they're heading to—should take this advice from Nicky Carpenter, an educational consultant based in Minneapolis, Minnesota. Carpenter advises that a college student who plans to live on-campus should find out what the dorm room's electrical wiring is like and whether it can support a computer. "That's usually not a problem unless it's a very old dorm," she adds, "but it's worth asking."

Does the school offer special discounts or financing plans for computers? This is an extremely important question because, if the answer is "yes," it may save a chunk of money.

When John's brother bought his Zenith at Clarkson, he got a \$4,000 system for about \$1,600; Campbell saved approximately 40 percent off the list price for her Macintosh by buying through Dartmouth. Many colleges are able to offer discounts of 35–50 percent on computer systems because they buy in bulk from companies like Apple or IBM; each company no doubt hopes that students will become accustomed to its brand and stick with it throughout their professional lives.

Colleges that sell computers also often have financing plans and service contracts that can help a student in a pinch. At the University of Iowa, for instance, the Student Loan Accounting Office offers students low-interest loans for computer purchase. Drake is considering a similar plan. If you intend to buy a computer for your child and the intended college has a discount policy, your best bet is to wait and buy it there.

Another good reason for waiting until your son or daughter moves to campus to buy a computer is that a roommate may already have one that can be shared. Or maybe the two roommates will decide to split the cost of one computer. This could be a good idea not only because of the financial aspect, but because of space. As Updegrove notes, "The typical dorm room was never generous with space in the first place. A computer, printer, and paper can take up a lot of room. It may be better to share one computer than to crowd in two."

If after reviewing the questions—and your finances—you decide not to invest in a computer, don't fear that your child will be at a disadvantage. As Updegrove notes, "The average college kid still uses a public computer. There shouldn't be any pressure to feel that he or she won't keep up without one."

Steven Antonoff, an educational consultant with Antonoff Associates in Denver, Colorado, agrees, but adds, "Colleges are making computers available at such a low cost today that it shouldn't be too difficult, with the appropriate planning and saving, to afford one at some point. If you're a student, it may not be during your first year, and you may need to pitch in some summer earnings, but if you can swing it, it's probably going to be worth it." **FC**

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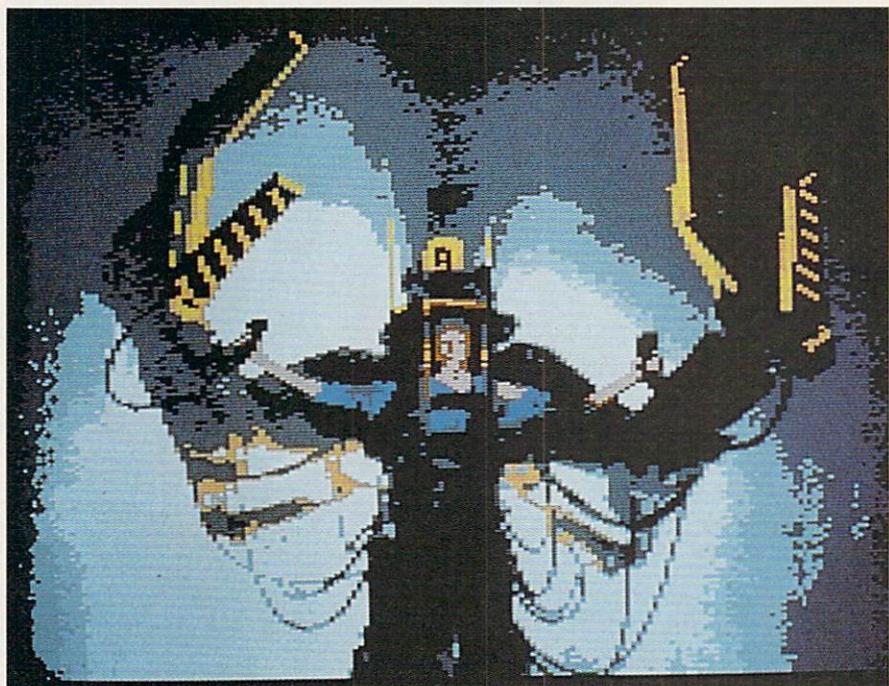
ENTERTAINMENT

HINTS, NEWS, AND NEW GAME FORMATS

Each month, this newly revamped department will bring you news and information about the latest (and future) games, gaming trends, and the availability of new formats, as well as tips for solving your favorite games. And don't miss our monthly reviews in the Software Reviews section.

WHAT'S NEW, AND WHAT'S RUMORED?

■ Good news for **IBM PC** and **PC clone** owners who lament the lack of entertainment software: Software publishers are finally listening. We hear that **Electronic Arts** programmers are readying some of our favorites for the IBM. Watch for IBM versions of *Lords of Conquest*, *Marble Madness*, *Arctic Fox*, *Robot Rascals*, *The Bard's Tale*, and *Adventure Construction Set*. You might not see them yet, but they're on the way. . . . **SubLOGIC** has released *Pure-Stat Baseball* (winner of FAMILY COMPUTING's 1986 Critics' Choice Award for Best Sports Simulation) for the IBM PC. . . . The latest in IBM PC and compatible games from **Sir-Tech** includes *Wizardry—Knight of Diamonds*, *Deep Space—Operation Copernicus*, and *The Seven Spirits of Ra*. . . . And **Mindscape** has a load of new packages for IBM owners: *Superstar Ice Hockey* is ready and waiting and **Cinemaware's** *King of Chicago*, *Defender of the Crown*, *Sinbad and the Temple of the Falcon*, and **SDI** should be on store shelves within the next couple of months. . . . But there's bad news for new **IBM Personal System/2** owners: so far, there's nothing in the way of fun designed to take advantage of the PS/2's great graphics. ■ While we were sniffing around for IBM conversions, a reliable source at **Mindscape** dropped the word that **Chris Gray**, designer of the hit game *Infiltrator* (100,000 copies have already been sold), is forging ahead with *Infiltrator II*. **C 64** owners should get the first crack at this one—sometime before the end of the year, we predict. . . . And **Mindscape** is almost ready to announce



In *Aliens* (Activision), weaken the Queen by jabbing with your power loader arms.

the details of **Chris "Balance of Power" Crawford**'s latest creation for the **Mac**—something called *Siboot*.

■ An insider at **Activision** says we should keep our eyes out for a new drag racing game for **C 64** owners called *Top Fuel*. The same source tells us that the company is plugging away at an unnamed boxing game for the **C 64** and **Apple II** series. Check out store shelves for this one later this year. . . . Word's out that **Steve Cartwright**, who designed *Aliens* and *Hacker* and *Hacker II*, is working on a game code-named *Air Rally*. Don't know any more about that one.

■ **Broderbund** is busy with a naval sequel to *Ancient Art of War* called (you guessed it) *Ancient Art of War at Sea*. It should be released soon for **IBM PCs** and compatibles and will cost about \$45. . . . For the **C 64/128**, Broderbund is putting the finishing touches on an arcade game called *Cauldron*, which should cost about \$30.

■ In a month or so, **Electronic Arts** plans to let loose *Ferrari Formula One*, a new racing program for the **Amiga**. . . . And **Brian Fargo** (creator of EA's *The Bard's Tale* and *The Bard's Tale II*) is caught up in a futuristic game called *Wasteland*. Look out for the **Apple II** series and

C 64/128 versions. . . . EA has also announced the release of an improved version of the original *Ultima I* from **Origin Systems**, an affiliated label. According to Origin Systems, this new version for the **C 64/128** includes better graphics and animation, as well as faster game play. . . . Speaking of affiliated labels, EA has added its twelfth: **DataSoft**, developers of *Conan*, *Zorro*, *Bruce Lee*, *Goonies*, *Alternate Reality: The Dungeon*, and *Alternate Reality: The City*. . . . *Earl Weaver Baseball* is already available for the **Amiga** and is in the stars for the **Apple** and **IBM PC** by the end of the year. This is a surefire way to add even more fun to the baseball season and to warm the hearts of rabid baseball fans between the World Series and spring training.

GAME HINTS

ALIENS. Activision. Draw on your skills as a pilot, scout, gunner, and

EDITOR'S NOTE: Titles listed for the **IBM PC/PCjr** will also run on many **IBM PC** compatibles. Owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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Advanced Flight Simulator™

CHUCK YEAGER'S Advanced Flight Simulator

BY NED LERNER

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ENTERTAINMENT

wrestler in order to defeat the biotechnoids who are trying to take over our sector of the Universe. Simulates six of the action sequences from last summer's hit horror/adventure film of the same name. (C 64/128, planned for the Apple)

■ In the Drop Ship Maneuvers, navigate by looking as far ahead as you can and restrict all your movements to small course changes.

■ The secret of the APC rescue attempt is to know where you're going. Don't worry about losing the first few times you play this scenario; just try to find the way out. Once you know where to go, link up your troops as early as possible. Then move everyone into a leapfrog pattern, bringing one after the other from screen to screen. This will keep them alive, as one will save another if the aliens surround the "point person."

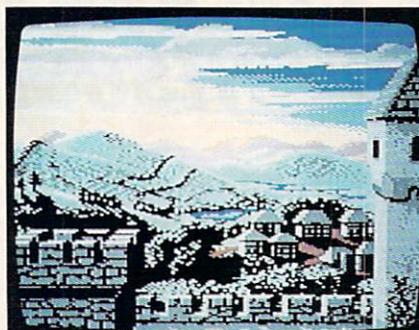
■ The Operations Room Rampage can be won only by a cool and steady player. Don't try to kill the aliens at first. Drive them back and pick off a few who venture too close to your flamethrower. The front ones will keep the others back, causing an alien "traffic jam." This will prevent the fast aliens from ripping past you. Just keep them at bay and continue to pick off the lead monsters until your team is safe.

■ The secret of the Air Duct Maze Scramble is learning which turns lead where. If you map your way through, remembering the proper order of turns and alternate routes, you'll find the correct route to the landing field after only 20 or 30 tries.

■ Much the same procedure applies to the Newt Rescue Race. Take your time learning the proper route and avoid shooting aliens whenever you can get around them.

■ Finally, when you make it to the One-on-One Confrontation against the Queen, remember that she's a lot stronger than you are until you knock some of her strength points down. The way to win is by jabbing with your power-loader arms at first and then dodging away from her. Gradually, as she weakens, you can go for combination punches, finally just picking her up to dispose of her as you see fit.

—JAMES DELSON



Defender of the Crown (Mindscape) is set in the Middle Ages.

DEFENDER OF THE CROWN. Mindscape. Select the role of your choice in playing the good guys against the computer's opponents. Set in the late Middle Ages—when Robin Hood, Ivanhoe, and other heroes fought to keep their Saxon heritage alive after the Norman's conquest of England—this game allows you to alter history and restore the crown to a Saxon head. (Amiga)

■ The most foolproof strategy to pursue in the game is to try to conquer the country by storm before your opponents can mount an effective campaign of their own.

■ First, attack the domain nearest you that has the largest army.

■ Next, return home each turn to pick up more troops, getting as many knights as you can afford.

■ Also, buy a catapult as soon as you can. You can't win without one.

■ Use all the troops you have to carry the fight further and further into Norman lands.

■ Take castles (after learning the proper procedure for reducing their number) and don't stop for anything.

■ Don't rescue maidens or go to jousts. (If you get invited, only duel for honor.)

■ Avoid facing off against large concentrations of the enemy. Run away rather than fight until you're sure you can beat them.

■ If you keep up a strong offense, sapping the Normans of their strength as you add to your own, you'll learn to win every time.

—JAMES DELSON

MARBLE MADNESS. Electronic Arts. Control an adventurous sphere through some of the toughest mazes around. Computerized version of the famed arcade-style coin-op game. (Apple, Amiga, C 64/128)

■ The secret of this game is practice. Go through the early screens over and over again to learn every possible move you'll need to know. If you can keep perfect control over the marble, you can get around, over, under, and through anything.

—JAMES DELSON

KING'S QUEST III. Sierra On-Line. Voyage to another land and use an evil wizard's secret spells to free yourself. This is the third installment in the *King's Quest* series. (Amiga, Atari ST, Macintosh)

■ Take the hand mirror from the wizard's bedroom. It will be useful when you confront Medusa in the desert.

■ Examine the top of the wizard's closet to find the brass key that fits into the cabinet in the library. (You'll find a useful surprise inside.)

■ In order to get some ocean water, you'll need the cup from the wizard's dining room.

■ Grab the black cat and take some cat hair.

■ Pick up the fly on the floor of the tower room at the wizard's house.

■ Grab a chicken outside the wizard's house and take some of its feathers.

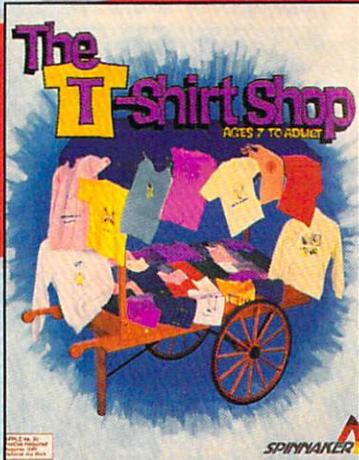
■ Make sure you pick up the feather that drops when the bird flies overhead.

■ Take the thimble from the bedroom dresser in the bear's house. You can fill it with dew in the bear's garden. While you're in the house, take the baby bear's porridge.

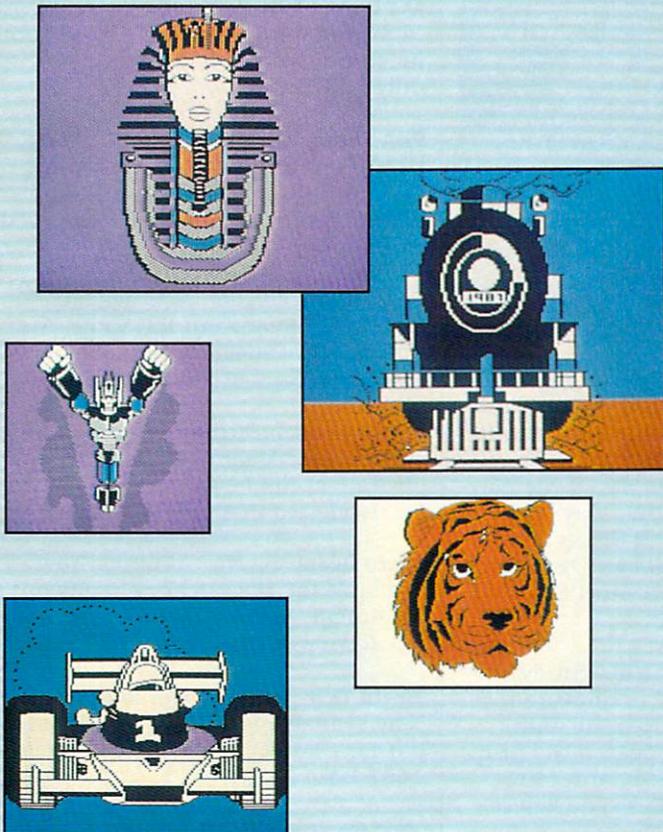
■ Find the tree near the desert with the large hole. Reach in the hole, and a ladder will fall from the tree.

■ Before entering the thief's hiding place, look inside to make sure he's asleep. If the thief is moving around

T-Shirt Shop™



How to Design Your Own T-Shirt in Five Easy Steps



1

Get Started

The first thing to do is to boot up T-Shirt Shop. You'll be greeted by an easy to understand menu that lets you see everything the program can do at a glance. You can LOAD pictures from the picture disk, DRAW your own pictures, TYPE in any slogan you can think of, and COLOR in your pictures.

2

Choose a Graphic

Now choose LOAD from the menu. You can choose from more than 50 supplied graphics. Hollywood celebrities, political and historical figures as well as plants and animals represent some of the categories included. For a change, you can draw your own picture. In either case, once you choose a picture, the outline will appear on the screen, ready to be colored.

3

Paint It

Here's your chance to show your artistic ability. Using the palette of colors, the brushes and the spraycans, you can paint a rainbow of color - you can even color in the picture to match your eyes! If you want, the program will automatically paint the picture with colors you choose.

4

Add Type

You've got a beautifully colored picture now. Go to the TYPE section, and choose from a variety of type styles. Name your picture, or attach some absurd sayings. Create catchy political slogans, humorous sayings, or something incredibly tacky.

5

Print It

Print your shirt design onto the special iron-on transfer paper (free sheets are included). With T-Shirt Shop, what you see on the screen is exactly what you'll get on your t-shirt. The paper will work with any ribbon - even in color - and will transfer perfectly to any t-shirt. Print your design, iron the transfer onto your shirt and you're in business. Impress your friends! Wear them into the office, to the beach, or to a wedding. T-shirts make great gifts, too!

T-Shirt Shop is the only program that allows you to design, paint and create your own t-shirts. In just minutes you'll be wearing your creations. Be the first on your block with a custom designed t-shirt, sweatshirt or even underwear...from T-Shirt Shop.

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ENTERTAINMENT

the hiding place, leave and come back later when he's not awake.

■ Purchase fish oil, lard, an empty pouch, and salt with the money found in the thief's purse.

■ While you're still in the store, make sure you pet the dog.

■ You'll find the mistletoe on a tree near the beach. —ROBERT BELLONE

URIDIUM. Mindscape. In this arcade game, you're the last defender of your galactic sector. It's your duty to destroy the 15 enemy Super-Dreadnought ships, which are draining the valuable mineral resources of your home planets. (C 64/128)

■ Zinc: Stay near the middle until you are safely past the rows of meteor or deflectors at the center of the ship. The landing field is toward the bottom of the screen.

■ Lead: Start your run at the bottom of the screen. Once you've gone by the first bunch of obstacles, fly to the top and it's clear sailing straight to the landing field.

■ Copper: Fly midscreen and then go down. When you pass a wall of deflectors, move to the top of the screen. You'll pass another wall with just one opening in it. Go down, pass more deflectors, and then move up a bit to make your landing.

■ Silver: Stay near the bottom of the screen until you clear the rows of communications antennae, and then move to the middle for an easy landing.

■ Iron: As with Silver, begin at the bottom and move up when you are beyond the antenna. Stay exactly in the middle until you are through the corridor of deflectors, and then do a 90-degree roll and fly near the bottom through the small gap in the deflector wall. Reduce your speed and land on the field, which is at the top of the screen right behind the wall.

■ Gold: Fly midway between the top and middle of the screen, slowly skirting the horizontal wall of deflectors. With a flick of the wrist, you should be able to drop down, reverse direction, and reverse direction again. Next, go all the way to the top

of the screen. The landing field is close to the top of the screen.

■ Platinum: Try flying this level entirely on your side. For this ship, you need to fly rapidly down, up to the middle, back down, just above the bottom, and up to the middle.

■ In fuel rod chambers, try to feel the rhythms of the flashing lights. When the lights are going by too quickly, click on QUIT or just close your eyes. If you just can't seem to get the rhythm, closing your eyes at least gives you a 50-50 chance of getting the points. —JEFF DONAHUE



Shanghai (Activision) is a lot harder than it looks.

SHANGHAI. Activision. Remove colored tiles from a geometric pyramid of matching and dissimilar pieces, with the object of emptying the playing field. Although this may look like a simple game of Mah-Jongg, it's actually a devilishly difficult entertainment. (Amiga, Apple, Atari ST, C 64/128, IBM PC/PCjr)

■ Look before you leap. Study the field before you begin removing tiles. You'll save a lot of moaning and groaning at having missed the proper move if you plan the order in which to take the tiles. The key is figuring out your strategy as many moves in advance as possible.

■ When you first start playing, use all the options you can, regarding them as a tutorial. —JAMES DELSON

NEW CONVERSIONS

Age of Adventure (Electronic Arts). Now available for C 64/128. Already out for Apple and Atari 800/XL/XE. Reviewed in December 1986 issue.

Aliens (Activision). Now available for Apple. Already out for C 64/128. Re-

viewed in June 1987 issue.

Amnesia (Electronic Arts). Now available for C 64/128. Already out for Apple and IBM PC. Reviewed in March 1987 issue.

Autoduel (Electronic Arts). Now available for Amiga and Atari ST. Already out for Apple, Atari 800/XL/XE, C 64/128, and Macintosh. Reviewed in June 1986 issue.

The Bard's Tale (Electronic Arts). Now available for Apple IIgs. Already out for Amiga, Apple, and C 64/128. Reviewed in April 1986 issue.

The Bard's Tale II (Electronic Arts). Now available for Amiga. Already out for Apple and C 64/128. Reviewed in July 1987 issue.

GBA Championship Basketball (Activation). Now available for Apple IIgs. Already out for Amiga, Apple, Atari ST, C 64/128, and IBM PC. Reviewed in February 1987 issue.

Hardball (Accolade). Now available for Atari ST. Already out for Apple, Atari 800/XL/XE, C 64/128, and Macintosh. Reviewed in May 1986 issue.

King's Quest I (Sierra On-Line). Now available for Macintosh. Already out for Amiga, Apple, Atari ST, and IBM PC. Reviewed in January 1985 issue.

Space Quest I (Sierra On-Line). Now available for Macintosh. Already out for Amiga, Apple, Atari ST, and IBM PC. Reviewed in August 1987 issue.

World Tour Golf (Electronic Arts). Now available for C 64/128. Already out for IBM PC. Reviewed in March 1987 issue.

SEND US YOUR HINTS—WIN A FREE GAME!

Don't miss the opportunity to share your original game hints and tips with other readers. Submit entries to: Entertainment Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, telephone number, and the brand of computer you own. If your tips are selected for publication, we'll award you a new game for your computer. We reserve the right to edit submissions for accuracy, clarity, and length. Unfortunately, we will not be able to acknowledge each submission. ■

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, & RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

There's no use beating around the bush. *Dark Castles* (Silicon Beach Software; [619] 695-6956; \$49.95) is an incredible achievement, and every owner of a 512K (or larger) Macintosh should own this game. It mixes the fantasy of Dungeons & Dragons with the speed and action of an arcade game. It adds an amazing variety of digitized sounds, high-resolution artwork, and user-controlled animation to create what I think is the best computer game ever.

The premise of the game is simple. As the hero, you have five chances to advance through various rooms in the Dark Castle. Once you've compiled the necessary weapons and experience, you can topple the evil Black Knight from his throne. On your journey, you'll encounter various obstacles, from plague-ridden bats and evil henchmen to flaming dragons. Your journey is rendered in amazing detail and flawless animation and accompanied by Silicon Beach's legendary sound effects.

Dark Castles is both challenging and addictive, making it an entertainment investment with a long life. Even my five-year-old works diligently to master the complex sequences of events and movements, endlessly fascinated with the sounds and motions that he's controlling. And the game demands concentration—there are traps and puzzles hidden along the way that must be solved through deduction and experimentation. Buy this one; you won't be sorry.

GS Upgrades. The GS upgrade for the IIe should be available by now. Is Apple's \$500 makeover for the IIe—achieved by replacing the main logic board—worth it?

First of all, the upgrade doesn't include a mouse, a numeric keypad, or a 3.5-inch disk drive. While none of these items is needed to run old Apple II software, most GS-specific programs will require the mouse (\$99) and/or the new drive (\$399). Therefore, a full-scale IIe upgrade really costs about \$1,000. I think there are

better ways to go.

First, a heavy AppleWorks user with no need for the graphics and sound capabilities of the GS could purchase memory expansion and accelerator cards (see June's "Machine Specifics") and get more speed and memory than with the GS upgrade.

Trade In, Trade Up. Second, a IIe owner could sell a complete system (see "Buying or Selling a Used Computer" in the May issue) and use the proceeds to buy a GS. Of course, prices for used IIe equipment will drop considerably as the GS gains in popularity, so the longer you wait the less attractive this option becomes.

Or you could use the IIe proceeds to buy a Macintosh Plus for a discount price of \$1,600.

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GENie (ID: C GAJEWAY).

ATARI

BY JOHN J. ANDERSON

Do you own both a monochrome and a color monitor for your Atari ST? If you do, you know that switching connectors between these monitors is more than just a hassle; after a while, it begins to weaken the video jack on the back of your ST. Finally, though, there's a solution to your problem.

Monitor Master. Monitor Master (Practical Solutions, 1930 E. Grant Rd., Tucson, AZ 85719; [602] 884-9612; \$49.99) is a monitor switchbox that allows you to switch easily between your monochrome and color monitors. If you use a monochrome monitor and a TV for color, you'll no longer need to unplug the monochrome monitor to use the TV for low or medium resolution.

In addition, Monitor Master provides a standard RCA jack for composite video so that using it with a regular composite monitor is possible—if you have an RF modulator output on your ST. An RCA jack is also provided that allows you to feed the ST's sound into your stereo system or your composite monitor.

Pick of the Month. *MaxPak*, new ST software from SoftWerx (P.O. Box 71118, Murray, UT 84107; [801] 272-5623; \$49.95), combines more than 10 powerful programs and utilities into a single integrated ST desktop accessory. Unlike other desktop accessories, most *MaxPak* features are available for both GEM and non-GEM programs. Among its features are:

- **Macro Keys:** This selection allows you to reduce long, complicated sequences of keystrokes to a single keystroke. It records your most recently typed keystrokes for instant playback.

- **High-Speed Print Spooler:** Automatically spools all printing from all programs. With it, you are able to allocate as much memory for the spooler as needed (up to the available RAM).

- **File Printer:** This feature prints ASCII files with optional enhancements that your word processor might not have. *MaxPak* provides page numbers, line numbers, margin offsets, headers, pause between pages, and *1st Word* compatibility.

- **Math Functions:** *MaxPak* calculates mathematical expressions. It adds, subtracts, multiplies, divides, and raises to a power. Complete error messages respond to malformed expressions.

- **RAM Disk:** By using the extra memory in the computer, *MaxPak* will create a RAM disk that functions as a second disk drive. It can be configured to any size and includes an automatic file copier.

- **Screen Clock:** A flickerless digital 12-hour clock is displayed in the upper right-hand corner of the screen. It indicates the hour, minute, second, and time of day (a.m. or p.m.). You can turn the clock on and off from the keyboard or via a dialog box. Up to eight alarms can be set in *MaxPak*—and you can set them daily or weekly.

- **Screen Saver:** This procedure automatically turns color or monochrome screens off if the keyboard or mouse has not been touched for awhile. The screen saver time delay can be selected from one to 99 minutes. With the press of a key or the

MACHINE SPECIFICS

nudge of a mouse, the screen instantly comes back on. This prevents damage to CRT phosphors (image burn in).

The *MaxPak* system requires an Atari ST, TOS in ROM, and a parallel printer. *MaxPak* consumes approximately 48K, plus whatever you allocate for RAMdisk, spooler, and macros.

JOHN ANDERSON can be reached on CompuServe (ID: 76703.654).

COMMODORE

BY SHAY ADDAMS

Got a mouse, but don't know what to feed it? *Pocket Writer 2*, *Pocket Planner*, and *Pocket Filer* all use Commodore's 1351 mouse (or the 1350 or any joystick) to operate pull-down menus, highlight and edit text, and perform other functions. This trio of C 128 programs (Digital Solutions; [416] 731-8775) costs \$99.95 or \$59.95 apiece.

For C 64 and C 128 users, Abacus Software just added 1351 support to its *Cadpak* graphic design software. (If you purchased it after February 1987, the upgrade is free.) Other software manufacturers will eventually be adding 1351 support as the mouse becomes more popular.

Why bother getting a \$50 mouse, you wonder, especially if you already have a 1350? The 1351 is faster and more accurate than the 1350, which is nothing more than a glorified joystick. Like the Amiga mouse, the 1351 converts the mouse's motion into proportional cursor movement, so it moves precisely in synchronization with the mouse.

Multipurpose Monitor. If you're planning to add an Amiga to your computer collection but don't have room for yet another monitor, check out Magnavox's RGB Monitor 80 (\$399). This 14-inch monitor provides 80-column display for the 128 and Amiga and 40 columns for the 64. Attach it to a VCR, use the tuner function, and it can act as a TV. And if you ever decide to switch computers, the monitor works with IBM PCs and Atari STs, too.

Partner 64. Timeworks has introduced a C 64 version of *Partner 128*, the cartridge-based desk accessory program. *Partner 64* (\$59.95) gives you a memo pad, calendar, address list, calculator, phone list/auto-dialer, screen print (text only) and a la-

bel maker/envelope addresser. It even enables your computer to emulate a typewriter. The memory-resident accessories function with other programs—you can, for instance, use the auto-dialer to make a call without leaving the word processor.

Two From Firebird. *Sentry*, an English game imported by Firebird Licensees ([201] 444-5700), uses solid-color objects—not the vector graphics used in games like *Star Wars*—to render a stunning three-dimensional effect. This fast-paced action and strategy program also features 360-degree panning, so you can spin around in a circle and watch the world go by—depicted by over 10,000 different landscapes. (No, I didn't count them.)

Firebird's latest graphic adventure is *Guild of Thieves*, available for the Amiga and the C 64/128.

SHAY ADDAMS, editor and publisher of *Questbusters*, an adventure-game newsletter, can be reached on CompuServe (ID: 72267.601) or on QuantumLink (ID: JBCHALMER).



BY HENRY BEECHHOLD

When the IBM Personal System/2 was first introduced, it appeared that only new IBM monitors would work with its new graphics capabilities. However, NEC has tested its popular MultiSync monitor with the models 30, 50, and 60 and declares it "fully compatible." All that's necessary is a connector/adapter, so that the MultiSync's nine-pin cable connector works with the IBM's 15-pin connector.

The Envelope Please. Quaid Software's *The Envelope Please* ([416] 961-8243; \$39) is a memory-resident program that enables your daisy-wheel printer or Epson-compatible dot-matrix printer to print envelopes. Aha!

After you run the setup menu, you return to DOS and load ENVELOPE, the drop-down part of the program. It allows you to enter your choice of envelope configuration (sideways or regular) and an optional return address.

The program works by capturing an address off the screen with the "address-grabber" box. You access this box by pressing the CONTROL, left SHIFT, and ALT keys in succession. When the address is neatly en-

closed, you hit RETURN to print out the envelope. Addresses can be snatched from any text that appears on screen. The program works from within DOS and from within an applications program, such as a word processor.

Trojan Horse Programs. Lurking among the many useful programs available for downloading from electronic bulletin boards are several "Trojan Horse" programs that will foul up your system in one way or another. The problem is particularly acute if you use a hard-disk drive and have all your programs and data stored there. You can lose part or all of the data on the disk, although some recovery may be possible with programs like *Norton Utilities*, *PC-Tools*, *MACE+*, and *Disk Explorer*.

If you're running scared of electronic bulletin boards, you can get a list of "killer" programs from several bulletin board systems. Among these are The Crest RBBS ([213] 471-2518) and The Sleepy Hollow PCB ([213] 859-9334). And the IBM Communications Forum on CompuServe has a file called DRTDZ7.ARC (*Dirty Dozen*) that lists these programs.

HENRY BEECHHOLD is author of *The Brady Guide To Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press).

MS-DOS

BY STEVE MORGENTERN

Assume that you, like me, use one or two personal computers for business and/or personal applications and don't care much about stringing a Local Area Network between the den and the garage. What's the importance of the new line of IBM computers to us?

One thing is certain—most of us with budgets to consider still won't be buying IBM-brand equipment. Despite industry fears that Big Blue would release a so-called "clone killer" offering superior features at a bargain basement price, the least expensive computer of the new line is the Model 30, which carries a \$1,695 price tag—without a monitor. A monochrome monitor costs \$250, and a color monitor, \$595.

The machine is impressive, but not comparable price-wise with a host of attractive clones.

Can It Be Cloned? Press reports quote some clone-makers as saying

it isn't that tough to imitate the new IBM standards. Until the new Operating System/2 is actually delivered (only for models 50, 60, and 80), though, it'll be difficult to judge any clone's compatibility.

The legal issues may be thornier. IBM has applied for literally hundreds of patents on the technology.

Finally, how long will IBM hold onto the Model 30's relatively high price? One rumor says that the actual cost of manufacturing the machine is a tiny fraction of the asking price, leaving IBM plenty of room to maneuver if it ever decides to flex its marketing muscle and take on the clones in the mass market.

Is That a Modem in Your Pocket?

There are plenty of PC peripherals with power and ability, but very few have style. The Migent Pocket Modem does ([702] 832-3700). It's a pocket-sized Hayes-compatible 1200-baud modem that fits in your shirt pocket, runs on a nine-volt battery, and plugs into a serial port.

In addition to practical considerations—like sharing the modem between a computer at home and one at the office or using it with your portable—the Migent is a great-looking piece of technology in a sleek, bright red and gray casing. If the modem doesn't make it into the Museum of Modern Art's design collection, I'll be amazed.

STEVE MORGENTERN can be reached on CompuServe (ID: 72545.606).

TANDY

BY STEPHEN MILLER

In the attempt to keep abreast of current industry news, I sometimes forget that there are still plenty of people who are perfectly content with their present computers. I was reminded of this when I unwrapped *Donald Duck's Playground*—a new Walt Disney Personal Computer Software game (Sierra On-Line; \$30) for the Color Computer. I booted it up on my CoCo 3 and was distressed to discover that it showed up in black and white on my RBGI monitor. This program was not intended for the Color Computer 3, but for a 64K CoCo 1 or 2!

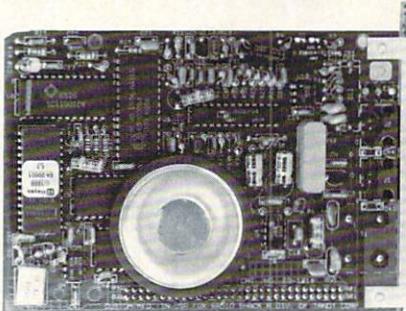
Sierra had remembered what I had forgotten—Tandy has sold more than a million of the earlier CoCo models. I've learned my lesson, and I promise not to ignore the concerns

of CoCo 1 and 2 and other longtime Tandy computer owners in my zeal to report on the new.

Back to Donald Duck. Donald Duck's *Playground* (see review in August 1986 issue of FAMILY COMPUTING) is an economics and civics lesson disguised as a game. It's rated for youngsters aged seven to 11, but I found it interesting enough at my advanced age. The object of the game is to guide Donald through various jobs so he can earn enough money to buy playground equipment for his nephews. The harder he works, the more money he earns and the more elaborate the playground equipment he can buy.

After the purchases are made, the equipment is delivered to the playground and you have to arrange it so that Donald's nephews can use it safely.

In the back of the instruction manual, there are other activities for kids, which have nothing to do with using a computer. I like the acknowledged fact that, useful as computers can be, human interaction is vital.



Tandy Plus 1200 Baud PC Modem

Modem Madness. This month's equipment upgrade was an internal modem in the Tandy 1000 SX. The Tandy Plus 1200 Baud PC Modem is one of the specially built expansion boards designed to fit into the EX's sideways and narrow slots. But it can also be used in other Tandy MS-DOS machines, such as the SX, by adding a Plus Upgrade Adapter Board which allows it to be turned 90 degrees to fit in a vertical slot.

The instructions for attaching the Plus Adapter (\$14.95) to the SX are clear enough, but I had a struggle installing it in place. I ended up using a pair of pliers to squeeze the ends so that they would slip down far enough to reach the slot that held them in place.

After that, I had no trouble inserting the modem in the proper slot. The modem worked flawlessly from

the first log-on. I would suggest, however, that you use another communications program rather than the one that comes with *Deskmate* 2. It works, but not as easily as many others.

STEPHEN MILLER is a computer consultant and journalist.

ORPHANS

BY PATRICK SPERA

A question I am asked quite often is, "What printer should I use with my computer?" This question is often followed by, "And what printer interface?"

For those of you who need a printer, cable, and interface, Alpha Scientific (P.O. Box 626, Chesterfield, MO 63017; [314] 878-7117) might have what you need. They have a PLUG 'n' PLAY package deal. You get a printer of your choice and an interface of the company's choice, where applicable. (Some computers only need a cable for the printer.) Plus, they send you 200 sheets of 20-pound computer paper.

For example, if a TS 2068 user wanted to get a Star NX-10, the individual would also acquire an Aerco CP interface for about \$312. A TI 99/4A user would get an Axiom TI interface with the NX-10 for the same price. An Osborne user could get the same printer with cables (the Osborne has a built-in interface).

TI Desktop Publishing. Asgard Software (P.O. Box 10306A, Rockville, MD 20850; [301] 559-2429) has an electronic publishing package, *Font Writer*, available for the TI 99/4A computer (32K, Extended BASIC, and disk drive required; \$24.95). It uses files from *TI-Artist* or *CSGD* for graphics and *TI-Writer* files for text, has a font editor and manager, and is compatible with Epson printers.

Timex of Portugal. When Timex folded its U.S. computer operation, the factory in Portugal was stuck with a number of Timex FDD Disk Drives, which were then distributed by Zebra Systems. For owners of those disk drives, there is *TOPS*, a newsletter for "Timex of Portugal System" users (write to John Bylander, 1203 N. Owens St., #308, Stillwater, MN 55082). It's printed bimonthly and costs \$9 for a one-year subscription.

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SCI 224 Monitor	\$297.77
SCI 24 Monitor	\$167.77
SM 804 Printer	\$199.77

ST HARD DRIVES

Atari 20MB	\$ 649.90
Supra 10MB	\$ 629.90
Supra 20MB	\$ 639.90
Supra 30MB	\$ 829.90
Supra 60MB	\$1789.90

ST SYSTEMS

COLOR SYSTEM	
520 ST Computer	
SF 354 Disk Drive	
SCI 224 Color Monitor	
Basic/Logo/First Word	\$ CALL
MONOCHROME	
520 ST Computer	
SF 354 Disk Drive	
SCI 24 Monitor	
Basic/Logo/First Word	\$ CALL

MONITORS

Samsung 14" Color	\$139.90
Samsung Green 12"	\$ 49.90
80 Col. Cable	\$ 8.77
Monitor Cable	\$ 5.77
NEC 12" Color	\$134.90

ABACUS

Assembler Monitor	\$24.99
Basic 128	\$39.99
Basic 64	\$24.99
Cadpak 128	\$39.99
Cadpak 64	\$27.99
Chartpak 128	\$27.99
Chartpak 64	\$24.99
Cobol	\$27.00
Forth	\$26.90
Powerplan	\$26.90
Quick Copy 2.0	\$14.90
Super C Compiler	\$39.90
Super Pascal	\$39.90
T.A.S.	\$39.90
Video Basic	\$27.90
XPER	\$39.90

STAR MICRONICS

NX 10	\$239.90
LU 1210	\$199.77

DISKETTES

Sony DSDD 5 1/4"	\$ 9.97
Memorex DSDD 5 1/4"	\$ 8.97
Precision DSDD 5 1/4"	\$ 7.97
Bonus by Verbatim DSDD 5 1/4"	\$ 6.97
Sony 3 1/2" DSDD	\$25.50
Sony 3 1/2" SSDD	\$19.50
Winners 3 1/2" DSDD	\$24.00

PRINTERS

Oki Mate 10	\$124.77
Oki Mate 20	\$134.77
Plug-N-Print C64	\$ 59.77
Plug-N-Print Amiga	\$ 69.77
Panasonic 1091	\$224.77
Panasonic 1080	\$199.77
Star NX 10	\$239.77
Star SG10C	\$228.77
Oki Mate 120	\$224.77
Epson LX 80	\$239.90
Epson FX 85	\$369.90
Epson FX 286	\$479.90

EPSON PRINTERS

LX 80 w/Tractor	\$259.90
FX 85	\$379.90
FX 268	\$504.90

COMMODORE CLOSEOUTS

VIC 1525 Graphics Printer	\$ 99.90
MPS 801 Printer	\$ 97.90
MPS 803 Printer	\$109.90
C1600 300 Baud Modem	\$ 37.90
Commodore Plus/4	\$ 79.90

JOYSTICKS / ACCESSORIES

WICO The Boss	\$10.77
WICO Ball	\$14.77
WICO Bat	\$14.77
WICO 3 Way	\$18.77
WKOS Way	\$18.77
Kraft	\$ 8.77
Recoton Big Shot	\$11.77
3 1/2" Drive Cleaner	\$14.77
5 1/4" Drive Cleaner	\$ 8.77
5 1/2" Drive Cleaner	\$ 9.77
CRT Cleaner	\$14.77
C64 Cover	\$ 6.77
C128 Cover	\$ 7.77
800 XL Cover	\$ 7.77
520 ST Cover	\$ 9.77
Drive Cover ST	\$ 7.77
1050 Cover	\$ 7.77
1025 Cover	\$ 7.77
1017 Cover	\$ 7.77
130 XE Cover	\$ 7.77
1224 Cover	\$11.77
Print Head Cleaner	\$ 7.77

BATTERIES INCLUDED

Consultant	\$35.77
Paperclip	\$35.97
Paperclip w/Spell	\$47.77

1040 COLOR & MONO SYSTEMS

IN STOCK CALL FOR PRICING ...

ACCESS

Mach 5	\$22.50
Mach 128	\$29.90
Leader Board	\$23.90
Tournament Disk	\$12.90

APPLE

Eidelon	\$12.77
Koronis Rift	\$12.77
Perfect Writer	\$29.77

CUSTOMER SERVICE OR IN FLORIDA (305) 538-1364
FREE FREIGHT ON ALL ORDERS OVER \$100.00

226 Lincoln Road
Miami Beach, FL 33139

ATARI

Intro to Basic	\$ 4.77
Ultima II	\$ 17.77

MASTERTRONIC

Last V8	\$ 6.49
5 A Side	\$ 6.49
Slugger	\$ 6.49
Paul Macartney	\$ 6.49
BMX Racer	\$ 6.49
Sky Jet	\$ 6.49
Line Action Biker	\$ 6.49
Skiwriter	\$11.99
Busical 3	\$11.99
Initial Recall	\$11.99
All 3	\$29.97

MICROPROSE

Acrojet	\$20.77
F15 Strike Eagle	\$19.47
Conflict in Vietnam	\$19.47
Gunship	\$22.77
Silent Service	\$24.77

SPRINGBOARD

Newsroom	\$29.00
Clip Art I	\$18.90
Clip Art II	\$22.00

SUBLOGIC

Jet	\$25.70
Flight Simulator II	\$31.70
Scenery Disks 1-6	\$13.70
Scenery Disks 7-12	\$13.70
Scenery Disks 6 Pack	\$69.70

PRECISION

Superbase 64	\$47.77
Superscript 64	\$47.77
Superbase 128	\$52.77
Superscript 128	\$52.77

CLOSEOUT

"MUPPET PAD"	by Koala Technologies
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BRODERBUND

Karateka	\$17.00
Printship	\$25.90
LIB 1/2/3	\$14.90
Companion	\$24.90
Bank St. Writer	\$32.90

8 BIT BACK-UP PROGRAM

Chipmunk	\$29.77
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ACCOLADE

Dam Busters	\$ 17.90
Fight Night	\$17.90
Hardball	\$17.90
Law of the West	\$17.90

AMIGA

Call for Pricing

... IN STOCK ...

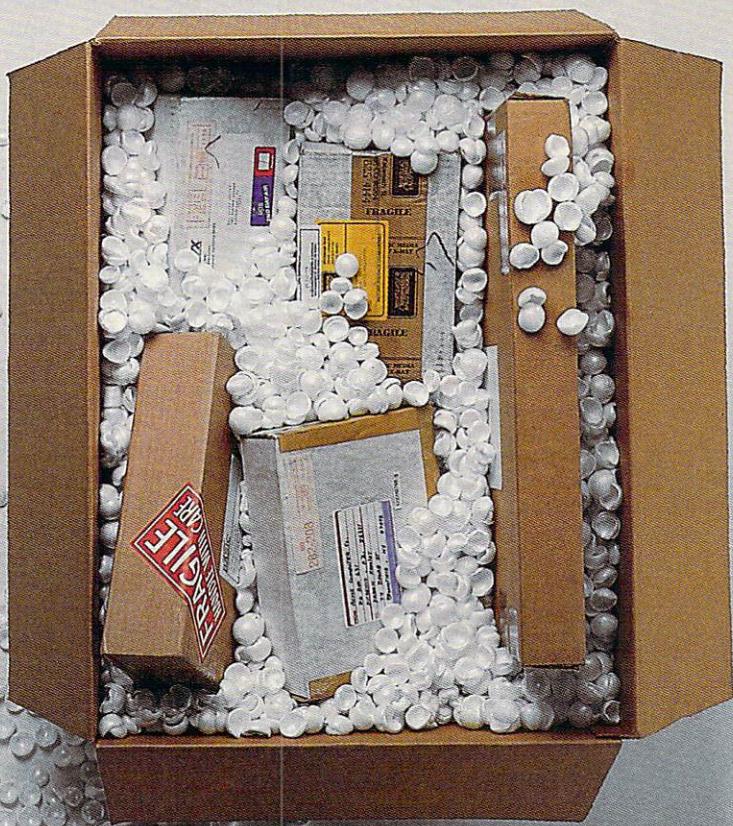
COMMODORE

1986 Taxpayers Survival	\$ 9.77
Commode Super Expander	\$ 9.77
Intro to Basic	\$ 4.77
Magic Desk I	\$14.77
Hes Writer 64	\$19.77
Multiplan	\$24.77
Castle Wolfenstein	\$ 7.77
Jet	\$14.77
Scenery Disks 1-6	\$13.70
Scenery Disks 7-12	\$13.70

The Mail-Order Buying Boom

SHOPPING BY TELEPHONE HAS BECOME AS AMERICAN AS APPLE PIE. HERE'S HOW TO ENJOY ITS BENEFITS AND AVOID THE BAD APPLES.

BY LINDA WILLIAMS



Mail-order buying is one of America's latest sweethearts. We seem to love the ability to shop without leaving home. Thanks to catalogs, newspaper and magazine advertisements, and the telephone, everything from sweaters to stereos can be delivered to our doorsteps. An estimated \$60 billion went toward mail-order purchases in 1986, and the amount increases about 10 percent a year, according to the New York-based Direct Mail/Marketing Association.

Many computer users are proud participants in the mail-order boom. And in recent years, companies offering software, chips, modems, computers—you name it—have sprouted up

across the nation. Of the \$22.5 billion that Americans spent on personal computers last year, about one-tenth was spent through mail order, says Future Computing, Inc., a Texas-based research organization. This growing outlet for sales helped force some 450 computer stores to close their doors in 1985, according to another research firm, Store Board, Inc.

THE LURE

Who could argue with the convenience of mail-order shopping? With an array of advertisements and catalogs in your home, you can do comparison shopping and find the products you want for the best possible prices. Then, you just call different mail-order houses and ask your questions or place your order. (See "How to Place a Phone Order.")



If mail-order companies offer the same products you find at your local computer dealer, why the price difference? Overhead is one reason for higher prices in stores: Retailers need to pay rents or mortgages for nice-looking sales facilities, bills for lighting and heat or air-conditioning, and salaries to salespeople, managers, technicians, and cleaning personnel. While mail-order firms need space and employees, they can minimize those costs, as they don't deal with customers in person. Mail-order companies also save themselves money by buying merchandise in bulk—instead of purchasing a few units at a higher cost per item. These savings are, in turn, passed on to consumers.

Mail-order software often costs 40 percent less than manufacturers' list prices. For instance, Russ Walter, author of the "The Secret Guide to Computers" series (Russ Walter Publishers), found *WordPerfect* for only \$195 through Telemart ([800] 426-6659) in Phoenix, Arizona, even though it lists for \$495. Walter recommends that you call the actual manufacturer (in this instance, *WordPerfect* at [800] 321-5906) if you have problems or questions about the program.

HOW TO PLACE A PHONE ORDER

1. On a sheet of paper, write the company's name and phone number, the date, and time of your call.
2. Before calling the company, make sure you have handy the advertisement or a note that describes the product you want and includes the item number, its features, and cost.
3. When your call goes through, write down the name of the representative you speak with.
4. Tell the representative what you want to order and where you saw it advertised.
5. Ask if the item is in stock.
6. If it isn't available, ask when it will be. Write down that projected date, making a note to call back on that date. Never order a product that's out of stock.
7. If the item is available, ask and write down exactly what it will include and how much it will cost, including shipping charges. If you're paying by credit card, ask if there's any credit-card surcharge.
8. If you don't understand something, ask for an explanation. *Never* be afraid to ask questions.
9. Ask about the method of shipping (UPS or parcel post, for example) and when the company expects to mail the product. Can the company estimate when you should receive it? Again, be sure to write down the dates.
10. If you decide to place the order, ask the service representative for an order number, if there is one. Then ask the representative to repeat the order to you, to make sure you were heard correctly.
11. Ask if the company has a separate technical-support number; if so, write that number down and find out what hours that department is open.
12. Give your telephone number (home and work) and stress that the company should call you as soon as possible if any problems arise with your order.
13. After the call is completed, review your notes. Did you get everything down? Did you ask all the questions you had in mind? If not, call back immediately. —L.W.

Hardware, while trickier to buy through the mail because it's more complicated, can come with inexpensive price tags, too. Mail-order houses often offer great prices for IBM PC AT clones. Though rarer, Apple clones can be found at good bargains, too. The Laser 128, an Apple IIc compatible that lists for \$479, often sells for \$395—plus \$20 shipping and handling—through the mail. (One distributor is Central Point Software in Portland, Oregon; [503] 244-5782.) By contrast, the Apple IIc lists for \$940, but sometimes retails for \$695.

Nevertheless, don't assume that mail-order purchases are always cheaper. Your local dealer may develop an overstock of a certain item and offer it for a price you can't refuse. Plus, mail-order purchases do have "hidden" costs. To figure out if you're getting an optimal price, take the item's advertised cost, add the shipping charge, credit-card fee (if applicable), sales tax (usually not applicable if the company is out of state), and the price of the phone call (often, firms provide toll-free numbers). Compare that total with a price you've seen locally, adding the transportation costs (gas used or bus or taxi fares) involved in going to and from the store. Is the mail-order price still lower? Then by all means, proceed—but with caution.

THE LESSONS LEARNED

Mail-order prices can be astonishing, yet so can the potential problems. And like most things in life, the bad examples get more publicity than the good ones. While you may have heard some accounts of failure from those who've tried mail order, you can safeguard yourself from most problems. Just carefully consider purchases and be aware of the dangerous extremes, including fraud (which accounts for 1 percent of all mail-order purchases, according to *Consumer Reports*), businesses going bankrupt or disappearing, misleading advertisements, hidden additional costs, long waits for shipments, and delivery of less than what you expect.

Take, for example, the experience Mary Ann Riecke went through:

"I ordered \$222 worth of software from Northeastern (which has since gone out of business)," says Riecke, who runs a dog-obedience training school in Chicago. Her check was swiftly cashed, and when the package arrived—weeks after the projected date—one item was listed on the invoice as back-ordered, while another, *Apple Logo* (for \$75), was not listed or delivered.

Riecke says she called the company 28 times, each time getting a busy signal or being cut off. The one time someone answered the phone, Riecke was put on hold and then disconnected. Her letters to the company went unanswered.

Riecke considers the lost \$75 reason enough to avoid mail order. She knows, for instance, that a ribbon for her dot-matrix printer would cost \$7 or \$8 through the mail, yet insists on buying it at a local dealer for \$12.95. "It's nice to save money," she says, "but it's another matter when you lose your money along the way."

Yet others who've hit mail-order snags have stuck with shopping by phone. Richard Downie, for example, didn't let one bad experience keep him from making purchases through the mail; the potential rewards—particularly the satisfaction of finding a good deal—are too great. As Downie recalls, "On April 21, the order-taker said my two computers would be shipped in 10 days, after assembly and testing. On April 24, the company charged my VISA account \$1,983.29. I finally received the machines on June 21, but neither system was functioning properly." Downie sent the computer back, but when it was returned to him, it still wasn't working. He sent it back one more time. From several calls to the company, Downie learned that the essential parts were not in stock. Frustrated, he packed up all of the equipment, sent it back to the company, and asked for a refund. Since he had paid through VISA, Downie was able to get his money back—just as the company went out of business.

He takes precaution against future disappointments by following these commonsense tips, which should help you find the equipment you want and save a few extra pennies for your pocket.

1. Put your money where the word of mouth is.

Ask friends, business associates, and users' group members about their experiences with mail order. Most will have a favorite source for software, another for add-on boards, and still a third for printers and supplies. Keep notes on their advice, as a proven track record is the best recommendation for a company.

2. Let your fingers do the walking.

Thumb through magazines and newspapers taking note of the products that are advertised by mail-order companies. This will give you an idea of what types of products are available via mail order. You might find it helpful to keep a list of companies that offer products you are interested in and record their prices for your future references.

3. Know what to expect.

When ordering a computer system, you should know what it normally includes before you buy it via mail order. What looks like a bargain may not be one, if some of the essential parts are off-brands, missing, or in pieces. "You have to know the questions to ask," says Barbara Chertok, who writes a column about computer use for the Boston Computer Society/IBM PC User's Group newsletter. For example, mail-order firms often offer IBM AT clones with hard drives that run at the slower speeds of PC or PC XT drives. Of course, these substitutions may not bother you, but you should consider them when deciding if the price is right.

4. Read between the lines.

Mail-order ads—because they're often a company's only forum for showing its products—are notoriously jam-packed with text, numbers, and illustrations. Don't let the confusion

overwhelm you; but just the same, don't overlook the small print and catchwords. For instance, watch for the word *capacity*. If the ad says a motherboard has a 640K capacity, it may mean just that: Pay some more money for extra chips, and the 256K board offered can hold 640K of RAM.

As with any type of mail-order announcement, illustrations don't necessarily depict what the quoted price gives you. For instance, when you see a stereo rack in a catalog with two speakers, a turntable, a receiver, and a compact disc player, you know that \$79 won't buy the entire stereo system. Sure enough, the text beneath the photograph describes only the stereo rack. The same common sense should tell you that when you see an illustration of a computer system with monitor and dual disk drives, you should read the text, which may mention only the computer for the low, low price. With mail order, it's safe to expect bargains, not miracles.

MAIL-ORDER PRICES OFTEN RUN 40 PERCENT LESS THAN LIST.



5. Converse with the company.

"Would you send \$1,000 off into space, to people you don't know?" Chertok asks. "How do you know they're going to send you anything in return?" Most mail-order regulars suggest talking to personnel at the company before placing an order and then relying on

MAIL FRAUD: THE LAWS

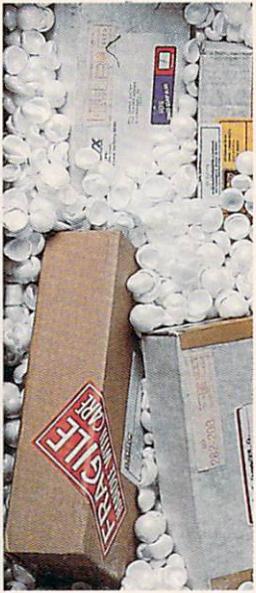
Consumers order millions of items from mail-order companies each year. Most firms are reliable and depend on repeat orders and goodwill to stay in business. But it helps to know your legal rights should you run into problems.

You have the right to . . . *

- Have mail-order purchases shipped when promised or to cancel for full refund. If no shipping date is stated, your right to cancel begins 30 days after (1) your order and payment are received or (2) your account is charged.
- Get a full refund—because of a shipping delay—within seven working days (or one billing cycle) after seller receives your request to cancel.
- Obtain a copy of any offered warranty before you buy.
- Refuse a delivery of damaged or spoiled items. Write *REFUSED* on the wrapper (at time of delivery) and return it unopened to the seller. No additional postage is required, unless the package came by insured, registered, certified, or C.O.D. mail, and you signed for it. If you open it first, enclose a note explaining the problem. Repackage it, add new postage, and return by certified or insured mail.
- Temporarily stop remaining installment payments to a charge or credit-card issuer—without being sued—while your dispute is being reviewed, provided the seller refuses to resolve the problem.
- Refer suspected misrepresentation and fraud to the U.S. Postal Inspection Service, Room 3517, Washington, D.C. 20260-2100; (202) 245-5445.

*Under the Fair Credit Billing Act, Prohibition of Pandering Advertisements Rule and FTC Mail-order Unordered Merchandise Rule and Mail Order Rule.

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your instincts. As Chertok recommends, "Always shop the people before you shop the machines." Plus, if you later need to make a change or addition to your order or have a problem with what you received, it's good to know you have a friend on the other end of the line.

6. Charge ahead.

Problems do arise every now and then, and when they do, you'll have more recourse if you've paid with a credit card. As Riecke discovered, once the company has cashed your check, it's more difficult to get refunds. If you've charged items that are never delivered or arrive defective, you'll have 60 days to stop the payment through your credit-card company. If a company doesn't accept credit-card orders, you should think about taking your business elsewhere.

7. Return to sender.

Most hardware comes with a 90-day warranty. When ordering by mail, as with in-store purchases, make certain that items you purchase are returnable. And by all means, pay close attention to the conditions for returns: the period in which they'll be accepted, the method for returning products to the company, and the procedure for getting refunds, for instance. Whenever you're purchasing hardware, beware of these words: *All sales are final.*

8. Honesty is the best policy.

Drake says he appreciates firms that "are willing to give you bad news." Chertok agrees, saying she likes PC Connection because "they will tell you if they don't have a product in stock. And you can call back on an 800 number to check when the company gets it in." Before completing an order, ask the simple question, "Is the item in stock?" If you place an order without asking, the company may take your order and your money, and leave you empty-handed for months.

Another essential question is, "When will you ship this order?" If the company hems and haws, perhaps you should call elsewhere.

9. How supportive is the company?

Technical support is for many, including Drake, the main reason for turning to mail order. Drake has found that many mail-order companies hire well-versed, patient technicians. "I was totally disgusted with the local retailer," he says. "I like to buy from people who have some expertise. I usually find that with selected mail order." When making your initial call to a company, write down the names and direct phone numbers of the technicians and note the hours they're available—just in case you need them later.

10. Start small.

Get to know a company by ordering small at first. This is your chance to gauge how well the

COMPARING PRICES: RETAIL VS. MAIL ORDER

To find out more about mail-order savings, FAMILY COMPUTING compiled a shopping list of 13 computer products and sent representatives on a bargain hunt. Within the same five-day period, these shoppers called or visited about a dozen mail-order houses and computer retail stores for price quotes. (Not all companies and stores carried every product. For instance, some sold only software.) What follows are the list prices of the products we asked about, as well as the ranges of prices quoted to us from both retail and mail-order establishments.

Product	List Price	Retail* Price	Mail-Order** Price
Amdek 410A monitor (green) (amber)	\$240 \$250	\$192-\$230 \$175-\$230	\$159-\$170 \$159-\$175
AT&T 6300 (640K, 2 disk drives, monochrome monitor)	\$1,820	\$1,295***	\$1,298-\$1,361
Barron's Computer Study Program For the SAT (Apple, IBM)	\$50	\$38-\$45	\$32-\$35
Broderbund's Print Shop (IBM) (Apple)	\$60 \$50	\$40-\$60 \$33-\$45	\$35-\$39 \$32-\$35
Epson FX86e printer	\$499	\$385-\$490	\$309-\$359
Hayes Smartmodem 1200 Hayes Smartmodem 2400	\$599 \$899	\$400-\$600 \$599-\$900	\$369-\$399 \$549-\$599
Lotus 1-2-3 (version 2.01)	\$495	\$319-\$495	\$329***
Microsoft Mouse (serial) (bus)	\$195 \$175	\$129-\$195 \$137-\$175	\$129-\$139 \$119-\$139
Software Publishing's PFS: First Choice	\$179	\$99-\$179	\$95-\$109

*These prices are based on visits and/or phone calls to the following retail stores between May 11 and May 16: BusinessLand, Computer Factory (N.Y.), ComputerLand (N.Y.), Egghead (L.A.), Exel Computer Centers (N.Y.), Radio Shack (N.Y.), Software Etc. (N.Y.)

**These prices are based on phone calls made between May 11 and May 16 to the following mail-order houses: 47th Street Photo and Computer, (800) 398-1410; LogicSoft, (800) 645-3491; Lyben Computer Systems, (313) 589-3440; PC Connection, (800) 243-8088; Priority One Electronics, (800) 423-5922; and Programs Plus, (203) 378-3662. Shipping and handling costs, sales tax, and credit-card charges (if applicable) are not included.

***This is the only price we were quoted.

COMPANY PHONE NUMBERS:

AMDEK CORP. (312) 364-1180

AT&T (201) 898-8000

BARRON'S EDUCATIONAL SERIES (516) 434-3311

BRODERBUND SOFTWARE (415) 479-1185

EPSON AMERICA, INC. (213) 539-9140

HAYES MICROCOMPUTER PRODUCTS
(404) 441-1617

LOTUS DEVELOPMENT CORP. (617) 253-9150

MICROSOFT (206) 882-8088

SOFTWARE PUBLISHING CORP. (415) 962-8910

firm deals with its customers. Keep a record of whom you spoke to and when, noting your answers to such questions as: Were the phone representatives helpful? Did they give straightforward answers to my questions? What day do they expect to ship the product? When can I expect to receive it?

When the shipment arrives, note whether it came at the expected time and if everything you requested was included. If the results look good on paper, chances are you can have a long and fruitful relationship with the company. On the other hand, if you come across one bad apple, at least you haven't lost your life savings.

11. Is it safe to substitute?

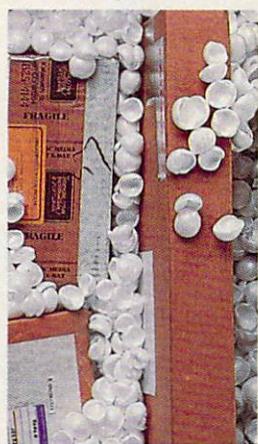
Often, when a company is out of what you want, the phone representative will suggest an alternative. Be careful if he or she tries to steer you to something that is 'just as good.' While most companies suggest perfectly reasonable

substitutions, it's a good idea to get a second opinion.

12. Realize the right price isn't always the best deal.

"I don't go for the lowest dollar," Drake says. "When I find a reliable supplier for certain items, I'll stick with that company."

Chertok agrees that sometimes a slightly higher price may include technical support and better service. "To me, of all the things you should be looking for, the lowest price is at the bottom of the list."

Now that you have all of this advice, read the accompanying sidebars, which deal with phone-order techniques, mail-fraud laws, the gray market, and price comparisons. Together, these articles should give you the information you'll need to benefit most from mail-order shopping. And you can join the ranks of computer users who call or mail their way to selections, convenience, and bargains. 

THE GRAY MARKET: BONANZA OR BOOBY TRAP?

Most of us look for the best possible price when shopping for a computer, peripherals, or software. One of the main ways that lower-priced computer products become available is through what's called the "gray market."

What is the "gray" market?

When consumer goods are sold through unauthorized distributors or retailers, that puts them in the in-between area called the "gray" market.

The biggest question people have about the gray market is, "Is it legal?" The answer is "yes." There are two basic ways that computers or other (mostly electronic) products enter the gray market. In the first scenario, a foreign manufacturer sells goods—computers, for example—to an overseas distributor, say one in Hong Kong. These goods are basically the same as those models intended for the United States market, but the manufacturer sells them to the foreign distributor at a price lower than the price paid by the authorized American distributor. Instead of selling all the computers overseas, however, the foreign distributor exports some to the United States legally (since all duties are paid), but outside the channels that the manufacturer's authorized distributor goes through. Once here, these computers make their way to discounters who sell them below authorized dealer prices.

The second way that computers, peripherals, and software reach the gray market is through authorized dealers here in the United States. For example, an authorized IBM dealer may have more computers in inventory than he or she can sell in a specific period. Instead of leaving the computers in the stock room—which costs money—the authorized dealer might sell a portion of the inventory to an unauthorized dealer at prices only a little above cost (or sometimes even at a loss). While such deals may violate agreements between a computer manufacturer and the authorized dealer, from the consumer's point of view, they are legal. The unauthorized dealer, who is often an electronics discounter, goes on to sell the computers at better prices than you can get from an official dealer.

What are the disadvantages?

Since gray-market items are purchased from

unauthorized dealers, customer support is either greatly reduced or nonexistent. Customers may need this assistance from a dealer after products are purchased if, for example, they can't get a new printer to work with a word-processing package or if they can't figure out how to port Lotus 1-2-3 data into their new personal-finance program. Such unauthorized dealers usually operate on a high-volume, low-margin basis, which doesn't allow for the costs of supporting customers. Also, a computer imported through the gray market might not have F.C.C. approval, which makes it illegal to sell and to operate (but not to buy). In some cases, the manufacturer will not honor warranties on computers purchased from dealers it has not authorized. This is true, for instance, of all IBM computers. A smart consumer will not buy a new computer without a valid warranty no matter how low the price, unless the dealer is willing to exchange, or is able to repair, a defective machine. Be smart yourself; investigate the dealer's policies before you put your money down.

What are the advantages?

Price, price, and price. Other than a low price, the gray market offers little advantage for the consumer—but price is a big advantage and it cannot be ignored. In most cases, those who shop by price alone can better protect themselves from a bad deal if they're experienced with computers, instead of uncertain or just starting off. If you're a savvy user, the trade-off between low price and no support can make for a smart deal, since there's little sense in paying for support that you'll probably never need. This is particularly true for software, where the support you'll get will most likely come from the product's publisher, not the dealer.

Are all low-priced computers gray-market items?

No. A low price *might* mean the computer came to the dealer via the gray market; but with more and more PC compatibles on the market—both domestically produced and imported—a consumer can still find the Triple Crown of Shopping: a low price, dealer support, and a valid warranty.

WITH MAIL ORDER, IT'S SAFE TO EXPECT BARGAINS, NOT MIRACLES.

—DAVID HALLERMAN

Moonlighting

BY
BERNADETTE GREY
AND
KAREN KANE

EARN A
SECOND INCOME
IN YOUR
SPARE TIME WITH
YOUR COMPUTER

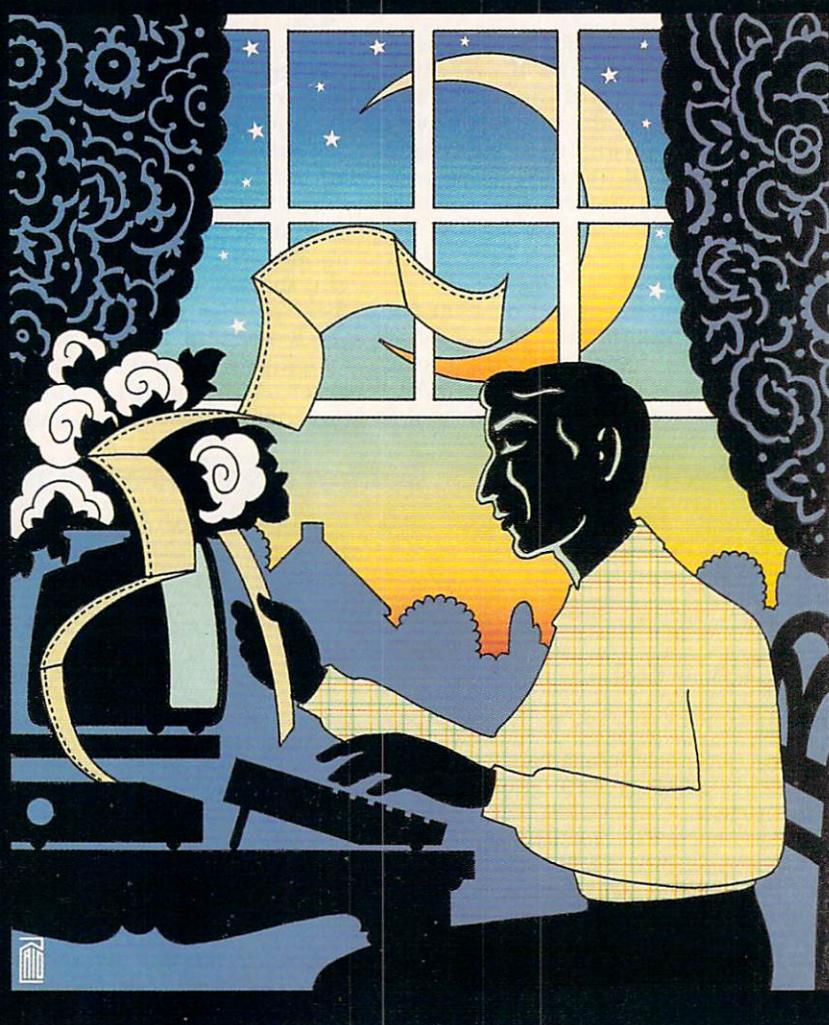


ILLUSTRATION BY BARRY ZAID

Now and again, visions of plumper bank accounts dance in most of our heads. While yearly raises and bonuses can give stagnant paychecks a much-needed boost, you'll probably need more than that to really make a difference in your lifestyle. Why not join the millions of other Americans who supplement their full-time incomes—and often become their own bosses—with a moonlighting business? Let yourself enjoy both the security of another income and the pleasure of working for yourself.

Just about everyone has dreams, both large and small, of starting a business—whether it be a store, a restaurant, a money-making hobby, or a corporation. What stops many people is that they doubt their own abilities, and they don't look for ways to make good ideas happen. But with careful planning, smart business ideas *can* develop. And if you use your computer as a toolbox to help you with everything from marketing to budgeting to de-

signing to filing, running your own moonlighting business may be easier than you think. In fact, your computer will open the doors to many moonlighting opportunities that otherwise wouldn't be available to you.

Unfortunately, moonlighting is a better income-boosting solution for some than it is for others because there are special skills and talents that are more in demand than others. Also, many people who already have busy schedules—particularly those with a demanding career, a young family, or a serious hobby—don't have the spare time to dedicate to a second job.

On the following pages, you'll read about people who *have* found the time for moonlighting ventures—and who've been successful with their computers' assistance. We'll tell you what these computer users are doing during their "off" hours and how they juggle more than one job. We'll also give you some moonlighting ideas and tell you about some of the not-so-obvious pros and cons of having a second career.

But before you start tossing around moon-

lighting ideas, ask yourself the following questions to help you decide whether or not moonlighting is in your stars.

IS MOONLIGHTING IN YOUR STARS?

What are my special skills and talents? Make a list of your capabilities, knacks, and areas of expertise. For a moonlighting venture, it's almost always better to utilize the know-how you already have rather than to try to learn new skills. Jumping into a field you know nothing about could be like stepping into quicksand.

How can I make use of my expertise? Now that you've figured out what your proficiencies are, decide how you can put them to use. If you're an art teacher, you can utilize both your art skills and your teaching experience. Some of the areas you might be able to explore are tutoring, creating computer graphics, designing publications, or starting a mail-order art-supply company.

How can I find out more about my prospective business? Let's say you're an accountant who's thinking about launching a newsletter on new tax laws for Certified Public Accountants. Look for books, magazines, and other reading material on the subject of desktop publishing. Talk to other newsletter publishers and find out what the venture entails. Ask them: What hardware is required? What software packages are you using? How much time do you spend writing the newsletter? What are the costs involved? How do you market the newsletter? What's your circulation? How much do you charge?

Will my business be filling a need? If you can't answer "yes" to this question—without hesitation—go back to the drawing board. Unless there's a need for your product or service, your business won't get off the ground. Conduct some market research: You may choose to talk informally to potential customers or clients. Or if you're willing and able, have an outside firm prepare and distribute a survey or set up focus groups.

Will people be willing to pay for my products or services? If so, how much? Figuring out pricing and fees is often overlooked until the last minute. However, unless you look at competitors' prices during your research phase, you may overestimate potential revenues. You may discover that you'll lose money trying to beat the price of a large local competitor. If that's the case, how about creating a more upscale business with a personal touch?

How much money can I spend on this moonlighting venture? It's a catch-22. You usually have to spend money in order to make money. As you know, some businesses have substantially lower start-up costs than others. But they do all cost money: Remember that everything from phone calls, stamps, printer ribbons, staples, and bond paper to answering machines, software, and computer furniture may be required for your moonlighting venture.

Can my computer take on the extra work load? Before you enter into a business arrangement

with your machine, think about its other obligations. Be fair to the rest of your family.

If your wife brings work home from the office and your kids word process their homework, your computer isn't always at your disposal. Maybe it's already being used most evenings and weekends. Your moonlighting undertaking could require a computer of its own—even a room of its own.

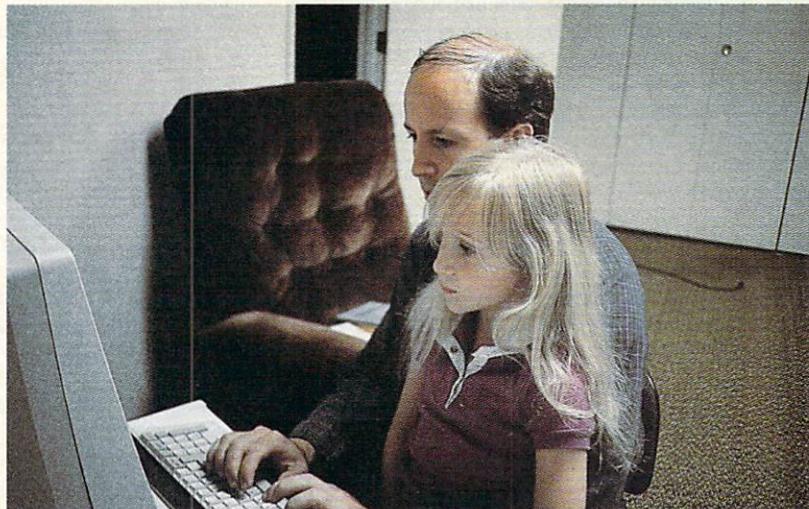
Do I have enough time for this business? This is the single most important question you can ask yourself—and the one that you're most likely to answer incorrectly. Finding a balance between your moonlighting and the rest of your life isn't easy; even when you find that balance, it's difficult to maintain it.

Figure out exactly how much spare time you have. Are you prepared to spend less time with your spouse, friends, or children? Do you want to cut back on your social activities and hobbies?

Maybe you have a job that requires extra hours during busy seasons. Or maybe you regularly go out of town. Will you be able to conduct your second job without interfering with your full-time one? Then figure out how much time your new business will require. (Moonlighting almost always takes more time than you think it will—especially in the beginning.) You may not be able to juggle everything.

If you do have the time for moonlighting, and you've come up with a business plan and researched your subject, then forge ahead. If you're a positive thinker, your lingering insecurities will soon fade away. The cool of the evening signaling the end of your workday may soon mark the beginning of another workday—and the dawning of a profitable new business.

PROFILE



DAVID SUTHERLAND of Glenwood, Maryland

Full-time profession: College professor

Moonlighting profession: Consultant

"Who are you talking to now, Daddy?" asks 8-year-old Heather Sutherland as she sits on her father's lap, mesmerized by the flow of information scrolling on his computer screen. Heather's father, David Sutherland, goes on

line almost every day to communicate with people as far away as Israel or as nearby as next door.

A professor of information systems management at the University of Maryland, Baltimore County, in Catonsville, Maryland, Sutherland earned his Ph.D. in systems analysis and design. Although teaching university students how to use different technologies is Sutherland's primary occupation, he has earned a lot of extra money as a consultant practicing what he preaches.

With an Apple IIe, Leading Edge Model D, 30MB hard-disk drive, and Hayes-compatible modem, Sutherland has found many ways to capitalize on his special skills and familiarity with computers. Most of his moonlighting activities are best described as consulting projects because he is selling his experience, expertise, and judgment rather than a specific service or tangible product.

Consulting With a Computer

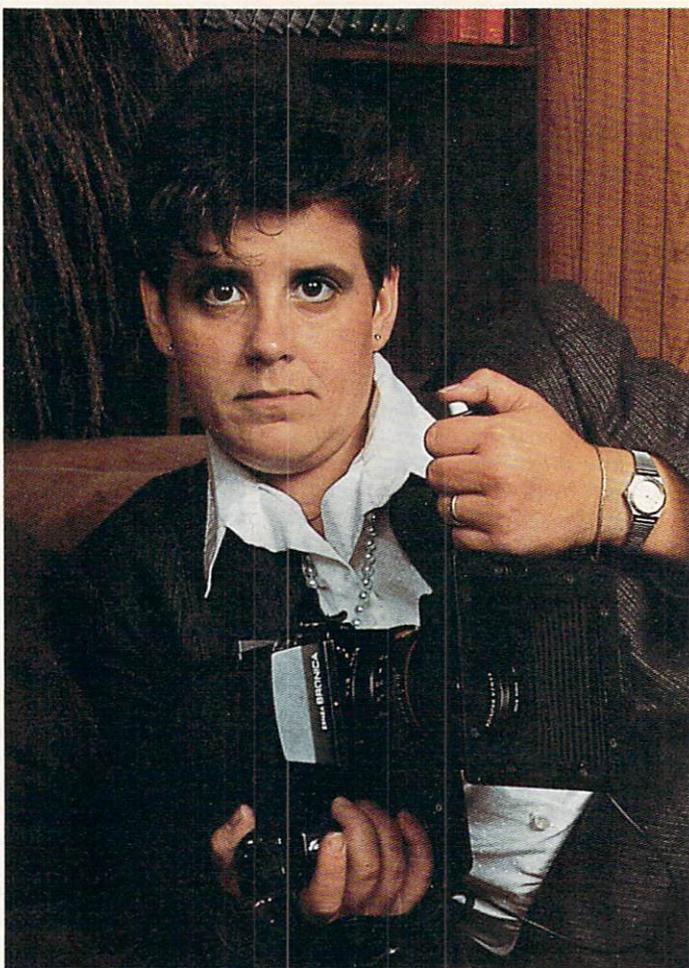
One current moonlighting project is on-line research. Sutherland is a member of a team of researchers who log onto various information systems to gather project-development data for the International Center for Information Technologies (ICIT). Sutherland charges ICIT a daily rate to direct the research, and when he's satisfied with the material gathered, the team will prepare a report outlining its findings. In another project, he's helping a university student-health service restructure its billing procedures. Sutherland earns as much as \$100 an hour as a consultant.

Sutherland has made additional money by taking advantage of his knowledge of software packages like *dBase III* and *Lotus 1-2-3*. He sets up spreadsheet templates and databases for people who want the professional look of computer-generated reports but don't have the time or desire to learn the software. Sutherland also prepares graphs and graphic displays that people need for presentations. Because he knows the software, he can quickly and easily produce professional-looking reports and presentation graphics for a reasonable price. He charges \$20-\$40 an hour and can produce up to 10 overhead displays in an hour.

Sutherland's wife, Betty, has also earned money from moonlighting. An English teacher and mother of two, Betty finds time to work on her own projects when the children are in bed. She learns word-processing packages and then holds workshops to teach secretaries and other teachers how to use them. She has also earned \$10-\$20 an hour doing data entry via modem. (Graduate students often have government research grants and can pay someone to enter their data for them.) Some of Betty's other recent moonlighting jobs include writing articles and business brochures with her Apple IIe and *WordStar*.

David and Betty Sutherland figured out that in 1986 they spent about 400 hours moonlighting and earned about \$50 an hour. Betty remarked, "Neither one of us advertises. We get jobs by word of mouth. If we advertised we'd be swamped!"

PROFILE



PHOTOGRAPH BY ASHLEY MAY

DORI MAY of Claremore, Oklahoma

Full-time profession: Restaurant owner
Moonlighting professions: Photographer,
button maker

If Dori May and her husband, James, want to catch a movie at a "local" theater, they have to drive 30 miles to Tulsa—and then make the 30-mile return trip. Although they're both movie buffs, Dori and James will trek into Tulsa only when a much-talked about movie like "Platoon" is playing.

Instead, two or three nights a week, they will tuck their 8-year-old daughter, Ashley, into bed and watch one of 400 movies on one of their three VCRs or three video disk players. That they ever find the time to dim their lights and watch "The Great Santini" or "The Searchers" for the umpteenth time is hard to believe, considering how busy their businesses keep them.

Dori and James own and run "The Pits"—a Texan-style barbecue restaurant. Dori works the 8 a.m. to 4 p.m. shift, seven days a week, and her husband works evenings. The 29-year-old mother also moonlights as a photographer and has her own button business, while James makes extra money as a freelance writer. "We stay up real late at night and get up real early in the morning," admits Dori. "And our computers [two Apple IIcs] don't stay cold for very long."

Soon after the opening of the restaurant in March 1986, Dori gave up a full-time photography career and closed down her studio. She didn't know how she'd ever find the time to shoot much more than a wedding now and again. But with the help of their Apple IIc, the Mays figured out how to organize the books of the restaurant business in just a couple of hours each month. Using BPI Systems' *BPI General Accounting*, Dori has minimized her accounting, tax, and payroll chores by plugging in everything from meat bills to daily sales. What could have taken a couple of hours a day takes about two hours a month. The Apple IIc was also put to use in menu planning, inventory control, and business correspondence. They use the computer to print fliers and banners and store a copy of "The Pits" menu on disk so that changes can be made without redoing the entire menu.

Photography Reenters the Picture

Since Dori was able to save more time than expected on her restaurant work, she decided to resume her photography business. On many evenings and weekends, Dori can be found at her photography studio taking shots of local high-school seniors, sports teams, and families. Using the *AppleWorks* database, Dori keeps her price lists on disk and prints them out herself on colored paper she buys in reams. She saves about \$50 whenever her prices, addresses, or anything else changes because she no longer uses a typesetter.

Dori also keeps a database of her clients' names, addresses, birth dates, anniversary dates, and spending habits. She uses this database to keep a mailing list for promotional material. "I keep track of how much each family spends so that I can target my promotions," says Dori. "For example, not all of my customers will have an interest in \$150 wall-type portraits." Dori also sends former clients greeting cards for wedding anniversaries and children's birthdays. And *The Print Shop* handles advertising and direct-mail ads.

BRIGHT MOONLIGHTING OPPORTUNITIES

Many nine-to-fivers toss around the idea of moonlighting on evenings and weekends. Maybe you want to pay off a loan, save for a down payment on a house, buy a new car, or pay for a wedding. If you own a computer, why moonlight as a bartender, cabbie, security guard, or night-school professor? There are countless money-making opportunities that you can pursue right from your home, from your computer. Here are some ideas we came up with to show you how far-reaching the possibilities are: BOOKKEEPING; CONSULTING; CREATING COMPUTER-GENERATED PORTRAITS; DESIGNING PAMPHLETS AND POSTERS; ENTERING DATA; FREELANCE WRITING; OPERATING AN ELECTRONIC BULLETIN BOARD; PREPARING INCOME TAX RETURNS; PROGRAMMING; PROVIDING ASTROLOGICAL SERVICES; PUBLISHING A NEWSLETTER; RESEARCHING; DEVELOPING SOFTWARE; STARTING A MAIL-ORDER BUSINESS; TRADING STOCKS; TRANSLATING LANGUAGES; TRAVEL ARRANGING; TUTORING; TYPESETTING; WORD PROCESSING.

Taking a Shot at Another Biz

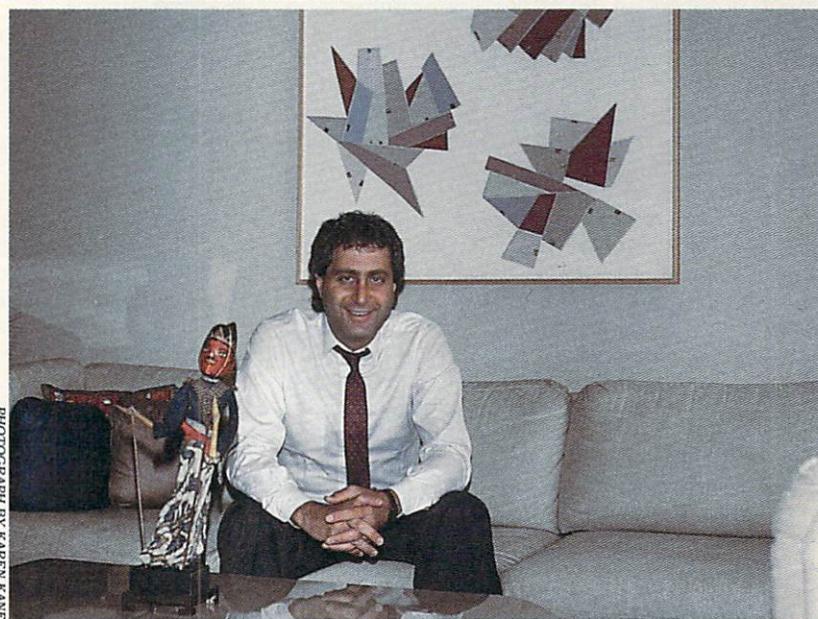
Dori had even begun toying with the idea of buying a \$500 button machine to make and sell buttons (for example, campaign buttons with slogans or sports-team buttons with photographs). She saw how the computer streamlined her restaurant and photography businesses and knew that it could do the same for a button venture. So she spent the \$500 on a button machine and made the money back when her first large customer, a baseball league composed of 600 boys, ordered team buttons.

Dori leaves sheets of buttons, which sell for a dollar apiece, at local stores, including the print shop, her restaurant, and a uniform-supply company. (These buttons cost her 15 cents each to make.) She uses her database program to keep an inventory of her buttons and to track which buttons she left at each location. Her database will also indicate which buttons are selling well and what type of button sells better in one location than another.

"It sure would be difficult to run my businesses without the computers," says Dori. "I probably wouldn't even have the button business."

She says computers have become entrenched in her day-to-day life. "If we were ever robbed, I'd rather that they steal all of our movie equipment and tapes, rather than take our two computers," she admits. "Our lives would fall apart without the computers. What would we do?"

PROFILE



DREW COOPER of New York City, New York
Full-time profession: Lawyer
Moonlighting profession: Real-estate broker

Drew Cooper, a partner in a law firm, lives in a Manhattan apartment complex called Lincoln Towers. Last winter, when the 3,900-unit rental complex turned co-op, Cooper established a real-estate brokerage in his apartment. He figured that as a resident of the

PHOTOGRAPH BY KAREN KANE

complex, he could efficiently collect information about the available apartments and provide that information to potential buyers. Cooper formed Residence Resource Ltd., and in six months, he's sold more than 25 apartments.

Selling Apartments on Easy Street

"Getting started was easy," recalls Cooper. He already had an Apple IIc with *AppleWorks*, so all he needed to get started was a printer (ImageWriter II), a separate telephone line, and an answering machine. He sent a letter, along with a Residence Resource application, to every resident in the complex.

Publicizing the brokerage is his largest expense; he spends about \$200 a week to advertise in the classified section of *The New York Times*. Between advertising, new equipment, and printing costs for the business stationery and envelopes, he estimates that his initial costs were close to \$5,000. However, he covered start-up costs with his first sale.

At first, the lawyer/real-estate broker charged each resident \$25 to list his or her apartment in his database and \$25 for each potential buyer to use the service. This fee was later eliminated to maintain a competitive edge over other brokerage services. Most brokers charge 6 percent on the selling price of each apartment they sell, but Cooper only charged 2 percent. He later increased the fee to 4 percent, but even then he was offering a substantial discount to his clients.

The *AppleWorks* database helps Cooper keep up with his second career. Each listed apartment is given an identification number and categorized according to the number of bedrooms (studio, one, two, or three), the floor it's on (one-10, 11-20, 21-30), the direction it faces, and whether or not there's a terrace, river view, parking space, or any other special feature. The maintenance fee, insider price, outsider price, and asking price are also listed for each apartment. (At press time, asking prices for Lincoln Towers apartments ranged from \$115,000 to \$450,000.) Cooper can then conduct simple searches and print out a complete list of the apartments that fit a potential buyer's requirements. By the end of May, 85 of the residents had listed their apartments with Residence Resource, and Cooper sold more than 25 of them. He believes that his service has listed and sold more apartments in Lincoln Towers than any other brokerage.

Cooper admits that, at times, operating Residence Resource takes more time than he had anticipated and that the business has lasted longer than he expected. "I certainly didn't think the brokerage would have a life of its own after the conversion, but it has." As a result, he adjusted his partnership agreement at his law firm to compensate for the time his real-estate venture takes from his job. Despite this adjustment and the fact that he has to fight for time on the computer with his 9-year-old daughter, Hayley, and 5-year-old son, Jordan, he wants to continue his lawyer-by-day/broker-by-night existence as long as the business comes his way.

PROFILE



JON STEVENSON of Tryon, North Carolina

Full-time profession: Chimney sweeper

Moonlighting profession: Desktop publishing

For special occasions, Jon Stevenson puts on the traditional garb of his profession—a top hat and a tuxedo with tails. Most of the time, any old black hat and coat will do. Stevenson owns and operates Chimney Magic, a chimney-sweeping business. When he's not up on someone's roof doing the dirty work, he's in his home office maintaining the business finances, designing a new advertisement, or writing the next wood-heat safety article for his newsletter, *The View From the Top*. He does most of his work on his Macintosh.

Rooftop Publishing

In addition to his business and his newsletter, Stevenson uses his Macintosh with *Page-Maker* to help others design their own promotions and publications. He rents out his equipment and his publishing experience to earn extra money.

Stevenson is currently helping a disc jockey design a magazine on the radio industry. Other recent jobs include designing a 32-page booklet celebrating the 75th anniversary of a local church, a 16-page brochure to promote a fashion show for a local charity, and the signs for an annual horse race.

He works closely with each of his clients to get a clear idea of what he or she wants to produce and then coaches the client toward a finished product. The clients usually have a good idea of what they want but don't know how to put it together. Stevenson takes a customer's written copy, pictures and artwork, and the general concept they want to convey, and uses *Page-Maker* and a Laserwriter printer to assemble a product that's ready to go to the printer.

Stevenson says that establishing fees is one of the most difficult aspects of his job. "I ballpark it. It's tough!" He usually charges by the job or by the page. Considering his time, as well as the wear and tear on his computer equipment, Stevenson has settled on a minimum of \$25 per page.

Two or three hours a week is about all he commits to his moonlighting jobs. His chimney-sweeping business keeps him busy weekdays from 8 a.m. to 6 p.m. He has other interests: "I'm a compulsive letter writer," says Stevenson, "and writing letters and stories for my girlfriends is more fun than almost anything else."

Panasonic Business Partner FX-600

THE GIANT ELECTRONICS COMPANY HAS ANOTHER WINNER

BY CHARLES H. GAJEWAY

Panasonic has built an enviable reputation for quality electronics (including a good line of dot-matrix printers), and the FX-600 carries on the tradition nicely. Compared to the earlier Panasonic Sr. Partner and Executive Partner computers, which had built-in thermal printers (and never quite caught on), the FX-600 is sleek and unobtrusive. It's sturdily constructed of quality materials and is easy to configure and service. The user manual is exceptionally clear, and the company has a toll-free phone number for user support.

The FX-600 has four full-length and two half-length slots (a third half-length slot is taken up by the printer/clock interface), holds 640K of RAM on the system board, and can accommodate up to four half-height storage devices (for example, floppy drives, hard-disk drives, or tape backup units). With one floppy disk drive and one 20MB hard-disk drive, the FX-600 sells for \$1,699. MS-DOS 3.1 is included at no additional cost. But there's more than an attractive price and solid backing to the FX-600.

The machine is extremely fast and responsive. The FX-600 runs at 7.16 MHz (with an Intel 8086-2 processor) instead of the standard 4.77 MHz (with an Intel 8088 processor) found in the IBM PC XT and in many compatibles. Repeated tests with spreadsheet and word-processing operations ran at least twice as fast as on an XT. Disk-intensive software, of course, will realize less of an increase in speed, since the processor won't affect disk-access speed. And for those few programs (mainly games) that require the 4.77 MHz speed, the clock rate can be toggled by pressing CTRL-ALT-+ on the keyboard.

Contributing editor CHARLES H. GAJEWAY has long been acquainted with IBM compatibles and bought one of the first Compaqs ever made (serial number 635).



The AT-style keyboard (with a large RETURN key and two sets of cursor keys) is the best I've ever used, bar none. It tilts to the perfect angle and is heavy enough to stay in place, even with vigorous use. The keys are ideally spaced and operate with a light but positive touch that makes it an absolute joy to use, even with my all-thumbs style. With two sets of cursor keys, you can lock the numeric pad on continually. This makes data entry considerably faster and easier than with the old-style keyboards.

The Panasonic comes without any

PANASONIC FX-600 VERSUS IBM PC XT *

	IBM XT	Panasonic FX-600
Price (640K):		
1 Floppy Drive	\$1,395	\$1,099
2 Floppy Drives	\$1,545	\$1,249
1 Floppy, 20MB Hard-Disk	\$2,660	\$1,699
Monochrome Monitor/Adapter	\$475	\$199
Processor	8088	8086-2
Clock Speed	4.77 MHz	7.16/ 4.77MHz
Parallel Port	No	Yes
Serial Port	No	No
DOS/BASIC	No (\$95)	Yes

*Even though most IBM PC XTs are out of production, the XT is used for comparison purposes because it is the accepted standard for most PC-compatible manufacturers.

video interfaces, so you can choose from a range of products. However, there is no power outlet on the back of the system unit for a monitor (as on the IBM PC XT and many compatibles), so you must find a monitor with a male plug that will fit into a wall socket.

Beyond this, a Panasonic monitor and video adapter are usually bundled with the computer. The monochrome monitor is sharp, clear, and surprisingly glare-free. The Panasonic video interface can also accommodate an RGB display, should you decide you want or need color.

Compatibility with the IBM PC XT is very high. All of the peripherals that I plugged in (including a multiuser disk drive!) ran perfectly, as did all my IBM software. Panasonic dealers should have a list of software and hardware that has been tested on the FX-600.

There are a few faults that offset the FX-600's considerable virtues. Probably the most serious of these is that Panasonic chose not to include a serial port in the basic configuration. With more and more users doing communications of one kind or another, a serial port is a virtual necessity for any computer, and this glaring oversight is surprising in view of Panasonic's evident concern for convenience and completeness.

Other concerns fall into the realm of petty annoyances. The RAM check at power-up is agonizingly slow (warm boots are much faster). And the toll-free customer service number can be busy for days, although Panasonic has assured me that this will be cleared up.

In use, the FX-600 proved itself to be an admirable partner, affording me the speed of an IBM PC AT for significantly less than the price of an XT—plus the peace of mind that the system is backed up by a large and capable service network and an established, stable manufacturer. To me, that's an irresistible combination. **FC**

BUYER'S GUIDE TO PORTABLE COMPUTERS

BY STEVE DITLEA

SMALLER, FASTER, HIGH-STORAGE IBM COMPATIBLES SPUR MARKET, ATTRACT NEW USERS

Until recently, buying a portable computer meant compromising on features. Any battery-powered models small and lightweight enough to be truly portable suffered from limited memory capacity, illegible screens, and a paucity of available applications programs. On the other hand, most models with ample storage, bright displays, and operating systems and disk formats capable of running standard software packages required a weight lifter's strength to carry and a nearby electrical outlet to power.

Now, such restrictions are quickly fading. Thanks to continuing improvements in low-powered computer chips that drain less electricity, disk drives (including 3.5-inch floppies and sturdy hard disks), and luminescent screens (that give you bright backlighting), you can take your computer anywhere and read its screen, too.

All the advantages of a small, compact computer and of a desktop model are combined in today's portables. Even the usual caveat that a portable be considered only as a second system no longer applies; you can run a home business or shuttle between home, office, and remote locations with one of these units and never miss a byte of crucial data. (See this month's "Telecomputing" department for more details.)

KIP HYAMS: A Disco Database

"I take my portable computer wherever I go," says Kip Hyams, who is the manager of a law office by day and by night runs the biggest mobile disco firm in southern California—The Dancing Machine—out of his home and two other offices. You'll find him using his 12-pound NEC MultiSpeed in court, juggling schedules or processing correspondence; at the office, sorting through client records and billing; or over his record turntables at a party, searching for the perfect songs from his database of over 8,000 dance platters. While the MultiSpeed has five applications programs built in, Hyams relies on the multipurpose, integrated *Framework* software-on-disk for most of his business applications.

With its standard 640K of memory and full IBM PC compatibility, the MultiSpeed has no problem running this workhorse program. Hyams considers his NEC MultiSpeed a step up from a desktop IBM PC or a barely luggable Compaq "portable" that weighs nearly three times as much as the MultiSpeed. "The NEC is faster and easier to work with," he explains. With a microprocessor that's twice as fast as the original PC's, the aptly named MultiSpeed (it can be switched to the lower speed) turns the sometimes sluggish *Framework* software into an efficient tool.

STEVE DITLEA, editor of Digital Deli (Workman Publishing), wrote "Buying or Selling a Used Computer," the cover story in FAMILY COMPUTING's May issue.

As for the smaller 3.5-inch disk drives that are standard with this and other recent portables, they pose no problem when transferring files from his 5.25-inch disks by using a cable to link the Compaq to the NEC. (See *Disk Drive* section in "Portable Shopping Tips" later in article.) With double the capacity of the 5.25-inch disks, the 3.5-inch disks make it possible to load MS-DOS operating system software and *Framework* directly from one floppy instead of the two separate disks needed before.

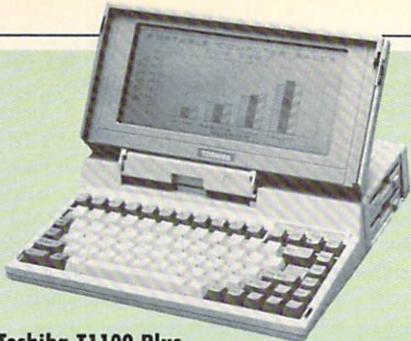
Not that this portable is perfect. "I don't like the display," Hyams admits. Its liquid crystal display (LCD), enhanced with "supertwist" technology to improve contrast, still requires ambient light—which strikes the screen at various angles to create reflections for illumination—making it useless in low-light situations. (In June, NEC announced an electroluminescent display with backlighting, which can be added to older MultiSpeeds.) But Hyams has developed his own solution: a small battery-powered light that clips onto the top of the screen.

SHIRLEY CORRIHER: Cooking Up Spreadsheets

For some portable computer users, even a unit weighing in the teens can be a problem. "It's a struggle to carry a 13-pound computer when you're on the road for a week," complains cooking teacher and consultant Shirley Corriher, of Atlanta. Her latest acquisition is a KeyStyle80, a notebook-sized model that weighs three pounds and fits into the Gucci bag that never leaves her side when she travels across the continent. "When I have a spare moment in a motel room or at the airport, I use it for note-taking. I would just die if I couldn't get work done during lulls on the road." The advantage of the KeyStyle80 is that when she's at home in Atlanta, Corriher can transfer her notes directly to her Datavue 25 portable (the one she used to carry around) without connecting any cables. Both Datavue models communicate via infrared light ports; all the head of Confident Cooking has to do is place the computers in front of each other and run the KeyStyle's built-in data transfer software. (The process doesn't work in reverse, however.)

When at home, Corriher uses the IBM PC-compatible Datavue 25 as she would a full-sized desktop unit—with WordPerfect to compose and print lists of ingredients and utensils for her next class or to polish her latest cooking article. She has been using Lotus 1-2-3's database to keep track of recipes and its spreadsheet to complete her tax return.

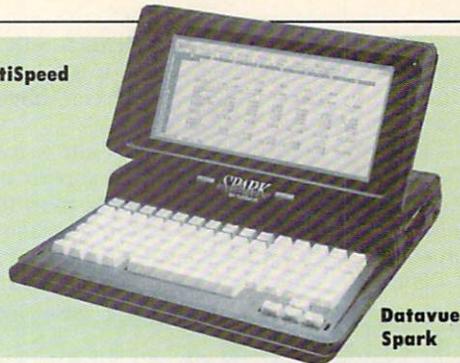
Though she complains that she doesn't have time to learn other software applications, she can turn for advice to her husband, Arch, whose own Datavue 25 helps with his consulting business. As a three-portable household, it would seem that all of Corriher's computing needs would be met. Still, one useful function eludes her: "I would like an easy-to-use phone-list manager."



Toshiba T1100 Plus



NEC
MultiSpeed



Datavue
Spark

DAVID VINE: Publicity By Modem

When the first notebook-sized computers were introduced earlier this decade, their puny memory and lack of sophisticated software seemed to rule them out for full-fledged business applications. But thanks to a thriving subindustry that produced add-on components and programs, the Tandy Model 100 and the Model 102—the best-selling portables to date—have become complete systems that are capable of a full range of tasks. For example, the public relations business that David Vine conducts out of his home in Lawrenceville, New Jersey, uses the Model 100 almost exclusively.

Much of Vine's output consists of written and telecommunicated text, including press releases, speeches, and newsletters. For word processing with formatting, he uses *Scripsit 100* software on an add-on 3.5-inch disk. For simple note-taking during client meetings or phone interviews, the Model 100's built-in text program is quite sufficient. When it's time to telecommunicate his words via telephone line to another computer (he uses Compu-Serve's EasyPlex most of the time), the Model 100's internal modem and communications software handle the job.

"I recently had to cover a visit by the Governor of New Jersey to the West Coast for one of my clients," Vine recalls. "When I got back to my hotel room, I wrote my press release and printed it out on the two-pound Rite-man LQ printer I carry with me. I put my printout on a fax machine to transmit back east in minutes."

When at home, Vine has a choice of two full-size printers, either a dot-matrix for speed or a daisy-wheel for letter-quality documents. Even though he often composes and distributes his press releases electronically, he doesn't see them on paper until they're reprinted in newspapers or magazines. He shares his printers with wife, Mar-Lee, a pharmaceutical research scientist, who has her own Model 100 for writing reports. The couple also has a Kaypro II—one of the earliest and most popular luggables—that Vine sometimes uses for record-keeping and accounting tasks. "I prefer using a hand calculator to keep track of my expenses," he remarks.

NOTEBOOKS

Today's portable computers fall into three major categories: notebooks like the one Vine uses for all his work; laptops like Hyams's multipurpose unit; or uprights like the one Corriher uses as her home "desktop" unit.

Though notebook-style computers are nearly the size of college textbooks, they're the closest thing to electronic notepads you'll find. Weighing between three and eight pounds, they're easily carried and fit into a briefcase or large handbag, with room to spare. With simple word-processing software built in, as well as modest file management and communications programs, they're ready to accept your input as soon as you boot up. Data is stored in internal memory and remains resident even when the power is turned off (which causes a slight drain on bat-

teries)—until you transfer information to optional tape or disk drives. Modems are also usually built into notebook portables, giving these pint-size computers greater capability than many so-called complete desktop units.

For all their convenience, the notebooks' LCD screens are limited in size to fit into a compact package: they display only eight or 16 lines of text instead of the usual 25, lines that are often only 40-characters wide as opposed to the standard 80. As we previously noted, internal memory is puny by current yardsticks. And because notebooks use their own operating systems, they're not compatible with other computer brands and software.

With these features, notebook-sized portables are best suited for note-taking, producing documents of less than 10 pages, and keeping track of daily schedules and addresses when traveling. They are also extremely useful as hand-held gateways to remote electronic information services. Another point in their favor: notebook portables list for less than \$1,000 and can be found for less than \$400. The Tandy 102 continues in the Model 100's tradition as being the fastest-selling portable around, while the modestly priced Keystyle80, with its full 80-character screen width, looks like an up-and-comer.

LAPTOPS

When in use, laptop computers lie flat with a flip-up screen angled for the best view—making them well suited for placement on a laptop or other improvised surface. Tipping the scales between nine and 15 pounds, a laptop is about the size of a briefcase, but may be too big to fit into one; laptops often come with their own handles and carrying cases. They come with at least one floppy-disk drive (often two) or with an additional hard disk. Internal memory is usually 256K or higher. Since they use standard operating systems (mainly MS-DOS), laptops can run the same software as their heavier desk-bound counterparts. With improved LCD, backlit LCD, and gas-plasma displays, today's laptops can perform like full-size desktop models.

The drawbacks to laptop portables are minimal: Their disk drives and large memories drain batteries quickly. This limits the use of a single charge of rechargeable cells to four to six hours or requires a wall socket as a power source. Also, size requirements have given rise to some ingenious, but nonstandard keyboard layouts.

In general, these laptops will do everything desktop systems can. They come with built-in interfaces that are often optional on larger computers. Their prices, however, are in the same range as their larger brethren—\$1,000 to \$5,000.

Among the hottest models are two from Toshiba: The T1100 PLUS, which weighs nine pounds and runs faster than a standard IBM PC; and the high-powered T3100, which performs like an IBM PC AT, has a 10MB hard-disk drive, and has bright gas-plasma display, all packed in only 15 pounds.

IBM's entry in the laptop field, the PC Convertible, has met with lukewarm response, but a lowered price and an improved supertwist LCD screen have put it back in contention.

The first laptop with a backlit supertwist LCD, the Zenith Z-181, has the largest screen of its kind (about the same size as a conventional monitor!). A newer version (Z-183) features a microprocessor with twice the speed of earlier models and a built-in 10MB hard disk.

The value champ among laptops, Datavue's Spark, of-

fers a high-speed processor and one 3.5-inch floppy disk drive at a base price of \$995, two-thirds the price of its nearest rival. And Grid Systems, the company that originated the laptop configuration with expensive non-IBM PC compatibles, has now brought out a moderately priced MS-DOS model weighing just under nine pounds.

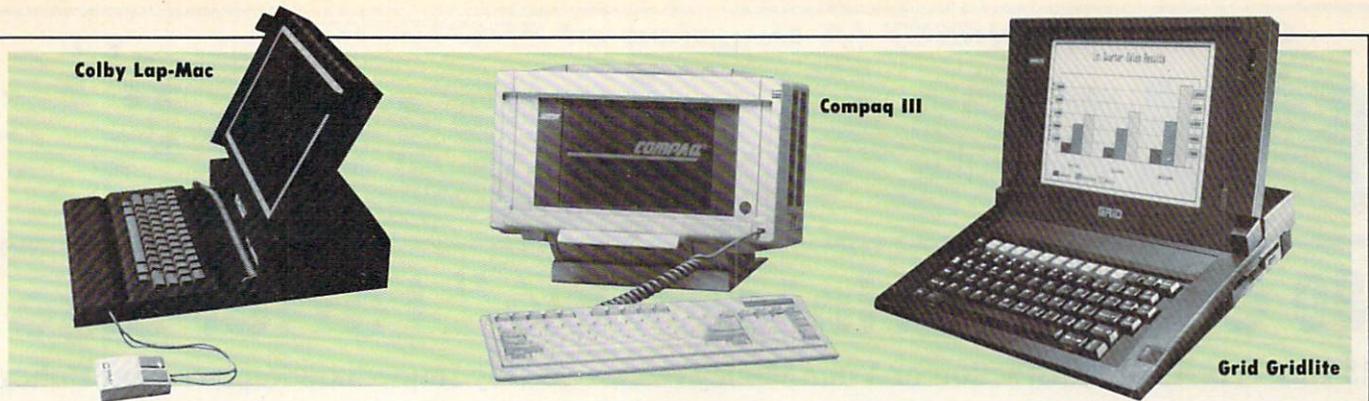
So far, all of the major laptop models have been IBM PC compatible (except the Tandy 600), but the good news for Macintosh owners is the introduction of two Macintosh-compatible models: the Dynamac, with electrolumines-

LEADING PORTABLE COMPUTERS A SHOPPER'S TEARSHEET

Base Price	Memory (Min/Max)	Disk Drives	Battery-Operated?	Weight (lbs.)	Text Display (Lines x Char.)	Software Included	Internal Modem
NOTEBOOKS							
Datavue Keystyle 80 (404) 564-5555	8K/96K	None	Yes	3.5	8 x 80 LCD Supertwist	c, cm, wp	No
NEC PC-8500 (312) 860-9500	\$999	64K/192K optional	3.5-inch optional	Yes	6	25 x 80 LCD	C, CP/M, wp, db, cm
Tandy 102 (817) 390-3487	\$499	24K/32K	3.5-inch optional	Yes	3	8 x 40 LCD supertwist	BASIC, wp, cm, sc, ad
LAPTOPS							
Colby Lap-Mac (209) 222-4985	\$4,495	1MB/4MB	One 3.5-inch (20-100MB hard disk options)	Yes	16	Varies; LCD backlit supertwist or gas plasma (\$500)	Mac Finder 300/1200 baud optional
Datavue Spark	\$995	384K/640K	One 3.5-inch	Yes	9	25 x 80 LCD supertwist (backlit option)	MS-DOS 300/1200 baud optional
Datavue Snap 1 + 1	\$2,095	640K/1.25MB	Two 3.5 inch	Yes	10	25 x 80 LCD backlit	MS-DOS 300/1200 baud optional
Dynamac (303) 233-7626	\$4,995	1MB/4MB	One 3.5-inch (20-40MB hard drive option)	Yes	15	Varies; LCD backlit	No 300/1200 baud optional
GRiD GRIDlite (415) 961-4800	\$1,750	128K/640K	One 3.5-inch	Yes	9.3	25 x 80 LCD supertwist	No 300/1200/2400 baud optional
IBM Convertible (800) 447-4700	\$1,695	256K/640K	Two 3.5-inch	Yes	12	25 X 80 LCD supertwist	PC-DOS, m sc, c 300/1200 baud optional
Kaypro 2000* (619) 481-4300	\$1,595	768K	One 3.5-inch	Yes	11.5	25 x 80 LCD	MS-DOS, WordStar, BASIC, cm + 5 more 300/1200 baud optional
NEC MultiSpeed (312) 860-9500	\$2,195	640K	Two 3.5-inch	Yes	11.2	25 x 80 LCD supertwist	MS-DOS, wp, db, cm, ad 300/1200 baud optional
Tandy 600	\$1,599	32K/224K	One 3.5-inch	Yes	9.5	16 x 80 LCD	Multiplan, Word, db, cm, sc 300 baud
Toshiba T1100 Plus (714) 730-5000	\$2,099	640K	Two 3.5-inch	Yes	10	25 x 80 LCD supertwist	MS-DOS, SideKick, Superkey 300/1200 baud optional
Toshiba T3100	\$4,199	640K	One 3.5-inch floppy and 10MB hard disk	No	15	25 x 80 gas plasma	MS-DOS, SuperKey 300/1200 baud optional
Wang LapTop (617) 459-5000	\$3,530	512K/1MB	10MB hard disk	Yes	14.25	25 x 80 LCD supertwist	MS-DOS, Wang Basic 1200/2400 baud optional
Zenith Z-181 (312) 699-4839	\$2,399	640K	Two 3.5-inch (10MB hard disk optional)	Yes	11.8	25 x 80 LCD backlit supertwist	MS-DOS 300/1200 baud optional
UPRIGHTS							
Compaq III (713) 370-0670	\$3,999	640K/6.6 MB	One 5.25-inch high-density floppy (20-40MB hard disk options)	No	18	25 x 80 gas plasma	No 300/1200 baud optional
DataVue 25	\$1,695	256K/1.25MB	One 5.25 (3.5-inch and 20MB hard disk option)	Yes	12	25 x 80 LCD backlit or gas plasma (\$200)	MS-DOS 300/1200 baud optional
Zenith Z-171	\$1,999	256K/640K	Two 5.25-inch	Yes	14.7	25 x 80 backlit	MS-DOS 300/1200 baud optional

KEY TO CHART: ad = address book; c = calculator; cm = communications; db = database; m = memory; s = spreadsheet; sc = schedule; wp = word processing.

*The Kaypro 2000 Plus, with enhanced features, should be available to customers now.



cent display; and Colby Systems' Lap-Mac, with a choice of backlit LCD or gas plasma screen.

UPRIGHTS

In most respects, upright portables are similar to laptops except that they are designed to be operated while in a vertical position, with a silhouette similar to that of an old upright piano (instead of the typewriter-like look of laptops). Their keyboards are usually detachable, allowing uprights to take up less room on a desk, airliner snack tray, or other confined area (they're not intended to be balanced on your lap). Uprights are heavier than laptops—from 14 to 18 pounds—and are ruggedly built.

Upright portable models are base priced from \$1,695 to \$3,995. Among the most popular units you'll find are Zenith's Z-171 (the first portable to feature a backlit LCD display, it was chosen by the U.S. Internal Revenue Service for its field auditors); the versatile Datavue 25 (available with a range of disk drive options); and the Compaq III (the fastest of all current portables, its microprocessor runs three times as fast as a standard IBM PC's).

Over the next few years, we'll see more portables with built-in hard-disk drives, bigger and better screens, in smaller and smaller packages. Will we ever see a portable combined with a phone and perhaps a facsimile machine or copier? I don't know. Ask Maxwell Smart. ☺

PORTABLE SHOPPING TIPS: Features to Look For

Screen Display. You'll spend many hours gazing at it, so a portable computer's display screen should be crisp and legible. The liquid crystal display (LCD) originally used technology similar to that of a digital watch face. It has been improved with "supertwist" materials that produce sharper characters—often in a blue color—but still depends on ambient room light for readability. Increasingly, LCDs are being designed with electroluminescent backlighting to make them readable under any conditions—often with an orange cast. The brightest displays of all employ amber-colored gas plasma screens, which require more power than batteries are able to provide.

Most models now display a full 25 lines of text, 80 characters across, just like regular CRT monitors. However, many portables have screens that are oblong in contrast to the CRTs' squarer format—causing graphics to appear compressed and distorted (though some software has been rewritten for the different screen size). Squarer displays are becoming common on new models, making them the functional equivalent of CRTs. In any case, back-panel jacks for connecting an external monitor are also often supplied, so that you can use a regular monitor.

Keyboard. Feel and placement of keyboard keys are important, especially if a portable will be used as a second system and you will be switching back and forth between computers. Size restraints make it impossible to duplicate the larger keyboards found on desktop models. Unfortunately, some portables' keyboards stray far from such norms; make sure the one you choose is comfortable for you to use. And, if you're going to be working with numbers, look for one with a separate numeric keypad (the NEC MultiSpeed and Datavue Spark have them).

Another factor to consider: if you will be using a portable in public, choose a keyboard that doesn't attract attention with loud key clicks. When typing on the Model 102's keyboard, for instance, almost no sound is produced.

Disk Drives. While a few notebook-sized portables still don't work with disk drives, most models offer either built-in or add-on floppy disk drives. The trend is toward 3.5-inch disk drives that are not only more compact, but also have greater capacity than the once standard 5.25-inch disks. However, if you already have a desktop computer with 5.25-inch drives, you may want a similarly equipped portable to avoid the inconvenience of transferring programs and data between disk formats.

Many portables with 3.5-inch drives offer optional 5.25-inch external drives to ease the transfer. Another solution is to transmit files via special communications programs and cables that connect the two computers. For instance, LapLink (Travelling Software; [800] 343-8080; \$129.95) is a kit with both 5.25-inch and 3.5-inch disks and a cable that fits various RS-232C configurations. The software allows you to transfer whole programs between the two computers at blinding speed. Fastwire (Rupp Brothers, c/o Executive Computers; [212] 557-6060; \$129.95) does the same.

Internal Memory. With MS-DOS-based portables as the rule more than the exception, most machines now start with 256K of memory, can accept up to 640K—and some have provision for up to 1.2MB. As usual, more internal memory means they're able to run bigger programs and store more data without constant disk accesses. On the other hand, more memory also means greater battery drain.

Interfaces. To connect a portable with useful external devices, various interfaces are needed. Most models include a standard parallel port for connecting a printer (sometimes a parallel port doubles as an input for an external disk drive). An RS-232 interface or a serial port is necessary for communications via cable with other computers or if you wish to add an external modem. (Many portables, of course, can be bought with an internal 300-baud or 1200-baud modem installed.) Often a video port for an external RGB or composite monitor is also included.

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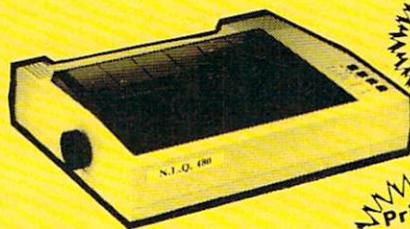
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Monitor Cable	\$ 19 ⁹⁵
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ADDRESS: 400 Anthony Trail, Northbrook, IL 60062; (312) 272-6760
PRICE: \$479; includes CPU, one disk drive, one serial port, one parallel port, and one external slot.

As writer of the Apple column for FAMILY COMPUTING's *Machine Specifics* department, I've received a lot of questions regarding Apple-compatible computers. Being curious myself, I did some investigation and discovered that the Laser 128 (sold by Central Point Software through mail-order and manufactured by Video Technology Computers) is generally considered to be the most compatible and best-supported Apple IIe/IIc clone. At only \$479, the Laser looks like a good deal, so I decided to check it out. The computer is reasonably well constructed, but not perfectly put together; yet it operates smoothly and very quietly. The keyboard has a slightly uneven touch from center to edges (not bad enough to be overly annoying), and the video image is quite sharp—although color output is somewhat



pastel in comparison to Apple's own II computers.

Externally, the Laser 128 bears a strong resemblance to the IIc (for instance, both have floppy-disk drives on the right-hand side), although the Laser is wider to accommodate a numeric keypad. Other features that set the Laser apart from the IIc are a parallel—as well as a serial—port, an

external slot that can hold standard Apple peripheral cards or a two-slot expansion chassis, and 10 function keys.

Software compatibility is high, but not perfect. With 128K memory (RAM), the Laser is capable of running most software designed for the Apple II series, such as the popular *AppleWorks*. But copy protection on programs is a frequent source of compatibility problems, and the Laser's video output routines can occasionally cause some difficulties as well. The majority of my software library, however, booted and ran perfectly—including a program whose author doubted it would run at all. I found the numeric keypad quite handy, and I enjoyed the near-silent operation very much.

Apple II clones, such as one made by Franklin Computers, have come under legal fire for copyright violations from Apple Computer in the past, but that problem doesn't exist here. Copyright litigation brought by Franklin Computers against Central Point Software was recently settled out of court; and Apple has apparently found no infringement problems with the Laser's firmware (ROM), the heart of the compatibility.

I like the Laser 128. I think it would be a superior alternative to a C 64 for families with tight computer budgets or as an educational machine dedicated to children. I feel that less than \$500 is a small investment in a child's education, so, although we have other "family computers," I've installed the Laser in my daughter's bedroom.

CHARLES H. GAJEWAY

ACCESSORIES

Mouse Cleaner 360

MANUFACTURER: Ergotron, Inc.
ADDRESS: 1621 E. 79th St., Minneapolis, MN 55420; (612) 854-9116
PRICE: \$17
HARDWARE COMPATIBILITY: Amiga, Apple II, Atari ST, IBM PC/XT/AT, IBM PS/2, Macintosh, and any other mouse with a 1-inch diameter ball.

Now that almost every computer can support a mouse, users are learning how helpful these devices can be. (See "Keyboard Alternatives" in next month's issue of FAMILY COMPUTING.) They're also learning that a mouse has the unfortunate tendency to pick up dirt as it's rolled across a table, which makes it become sluggish over time. Several products for cleaning the mouse are on the market, but none that I've seen is as easy to use as Mouse Cleaner 360 from Ergotron, Inc.

Instead of dismantling the whole mouse (as you have to do when us-



ing some other cleaning systems), with Mouse Cleaner 360 you simply remove the rubber ball from the cavity in the bottom of the unit. You then add a few drops of the enclosed cleaning fluid to the cleaner's Velcro ball (the spiky half of the Velcro), place that ball inside the mouse, and rub the mouse in a circular motion on the cleaner's pad (the soft half of the Velcro). This action removes most of the dirt that gets attached to a mouse's internal rollers, helping it move freely. Also enclosed in the cleaning kit is a chamois cloth for wiping out the cavity where the mouse ball rests.

The Mouse Cleaner 360 is effective. The various mice around the FAMILY COMPUTING office had built up layers of gunk over the years and had become quite hard to control. Now they run smoothly again. That's what you need from a mouse cleaner; and when combined with this product's ease of use, it's a good deal. ■

—DAVID HALLERMAN

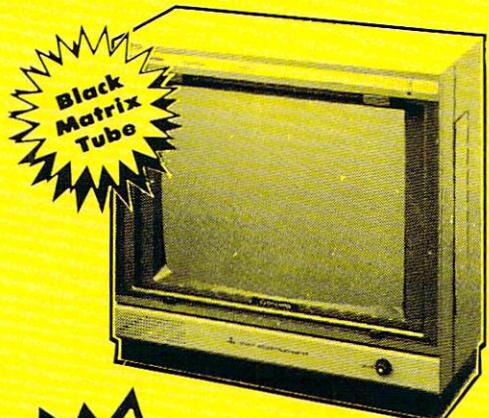
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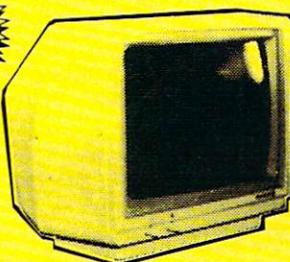
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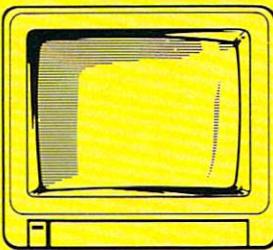


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SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PCjr or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone

means the software will run only on that machine.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

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				O	D	EH	GQ	EU	V
AWARD MAKER PLUS Baudville 1001 Medical Park Dr. S.E. Grand Rapids, MI 49506 (616) 957-3036 \$40 ©1986	Makes printing handsome personalized certificates quick and easy. Lots of attractive illustrated designs are included, with plenty of room for your own creativity. Printouts are detailed. —MORGENSTERN	64K Apple. 2nd drive optional.	90-day warranty. \$7.50 for backup. \$25 for non-copy-protected version.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
CELEBRITY Good Software Corp. 5429 LBJ Freeway, #720 Dallas, TX 75240 (214) 239-6085 \$90 ©1986	A word processor and more, <i>Celebrity</i> comes with a helpful collection of utilities, such as a spelling checker, a thesaurus, an appointment calendar, and a rudimentary database manager.† —SUMMERS	256K IBM PC.* 2nd drive.	30-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★	★ ★ ★ ★
EVERYBODY'S PLANNER Abracadata P.O. Box 2440 Eugene, OR 97402 (503) 342-3030 \$100 ©1985, 1986, 1987	Helps you create flowcharts and schedules. A worthwhile investment for business users trying to organize and analyze the steps needed to complete complex projects. It's difficult to operate, though; not for "everybody."† —MORGENSTERN	Reviewed on 64K Apple. Also for 256K IBM PC.* 2nd drive recommended. Joystick, mouse optional.	30-day warranty. \$13 thereafter. \$125 for non-copy-protected version.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
GUIDE Owl International, Inc. 14218 N.E. 21st St. Bellevue, WA 98007 (206) 747-3203 \$135 ©1986	Lets you write "Guidelines," which are on-screen-only documents that allow you to move between related pieces of information (either text or graphics) at the click of a mouse. A unique computer tool.† —AKER	512K Macintosh. 2nd drive recommended.	60-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
NUTSHELL 2.0 Nashoba Systems Inc. 175 Sudbury Road Concord, MA 01742 (617) 371-2028 \$150 ©1986	In the army of database programs, <i>Nutshell</i> falls somewhere between the heavy artillery and the foot soldiers. It's especially suitable for small businesses and a wide range of personal uses.† —SUMMERS	256K IBM PC;* (320K with DOS 3.0 or higher). 2nd drive, 8087 coprocessor optional.	30-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
PC-FILE + ButtonWare, Inc. P.O. Box 5786 Bellevue, WA 98006 (206) 454-0479 \$70 ©1984-1987	A major update of a classic database that's simple enough for beginners, yet offers experts features for full control. Shareware concept encourages you to try a friend's copy before you buy. —MORGENSTERN	384K IBM PC.* 2nd drive.	90-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★	★ ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; □ Poor; ★ Average; ★★ Good; ★★★ Very Good;
 ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
PERSONAL LAWYER—WILLS Lassen Software, Inc. P.O. Box 1190 Chico, CA 95927 (916) 891-6957 \$80 ©1983-1987	Asks a series of questions and prints out a will ready to sign and have witnessed. Acceptable for simple, uncomplicated wills covering estates of less than \$300,000. Not valid in Louisiana. —KLEINHOLZ	Reviewed on IBM PC/PCjr.* Also for Apple IIe/IIc. 2nd drive optional.	90-day warranty. Not copy-protected.	★ ★	★ ★	★ ★	N/A	E	★
SMART ALARMS & APPOINTMENT DIARY Imagine Software 19 Bolinas Road Fairfax, CA 94930 (415) 453-3944 \$50 ©1985, 1986	Desk accessories for setting up on-screen reminders (up to 1,600 such) and appointments. Also lets you record extensive notes keyed to any particular day. Most useful in offices where the computer is left on all day. —MORRIS	512K Macintosh.	Sold as is. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★	N/A	A	★ ★
WORD HANDLER Advanced Logic Systems 1283 Reamwood Ave. Sunnyvale, CA 94089 (408) 747-1988 \$80 ©1986	Basically a beefed-up, lower-priced <i>MacWrite</i> that provides up to four windows, so that text can be moved easily between documents. Its limitations make it best for occasional users. —MORRIS	512K Macintosh. 2nd drive recommended.	90-day warranty. Not copy-protected. \$20 for backup.	★ ★ ★	★ ★ ★	★ ★	N/A	A	★ ★ ★

EDUCATION/FUN LEARNING

KEYBOARD MASTER Channelmark Corp. 2929 Campus Drive, #400 San Mateo, CA 94403 (415) 345-5900 \$50 ©1986	Both hands work together from the start, and fingers must learn to reach in addition to typing the home keys as you develop good keyboard habits. My family found the program a little too rigid, though it is acceptable. —SUMMERS	IBM PC.*	1-year warranty. \$5 for backup.	★ ★	★ ★	★ ★	★ ★	A	★ ★
MACKIDS: EARLY ELEMENTARY Nordic Software 3939 N. 48th St. Lincoln, NE 68504 (402) 466-6502 \$40 ©1986	From the MacKids series of educational software, this package has three programs: one learning game and two fun games. Dozens of small problems (such as minimal graphics and sound) disappointed my kids. —AKER	Macintosh.	90-day warranty. Not copy-protected.	★	★	★	★	○	E
MIMI GOES TO TOWN Logidisque, Inc. P.O. Box 10 Postal Station D Montreal, Quebec H3K 3B9, Canada (514) 933-2225 \$35 ©1986	An imaginative, lighthearted program to help youngsters (ages 5+) become comfortable with the keyboard and the letters of the alphabet, as they send Mimi, the animated ant, off on a number of charming and entertaining activities.† —KOVACS	C 64/128. Color monitor, joystick recommended.	90-day warranty. \$10 for backup.	★ ★ ★	★ ★ ★	★ ★	★ ★	A	★ ★
THE NEW TECHNOLOGY COLORING BOOK The Software Toolworks 1 Toolworks Plaza 13557 Ventura Blvd. Sherman Oaks, CA 91423 (818) 907-6789 \$20 ©1986	Teaches basic concepts about recent technological advances and discoveries (black holes, for example) while you color the illustrations by clicking the mouse on the on-screen spaces. Artistic constrictions made it best for my 5-year-old. —SUMMERS	Reviewed on 512K Amiga. Also for Atari ST. Color monitor.	30-day warranty. Not copy-protected.	★ ★	★ ★	★ ★	★ ★	A	★ ★
UPTIME: VOL. 1, NO. 9 Viking Technologies, Inc. 174 Bellevue Ave. Newport, RI 02840 (401) 849-4925 \$12-\$15 each; \$69-\$89/12 issues ©1987	Disk-based magazine that includes games (solitaire cards and arcade-style shoot-'em-up), utilities (one for fonts, the other for fast disk duplication), an application (make your own quizzes), and desk accessories. Well done. —HALLERMAN	Reviewed on Macintosh. Also for Apple, C 64/128, IBM PC/PCjr.* Printer optional.	Lifetime warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★	★ ★	E	★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good;
★★★★ Excellent; NA Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
BUREAUCRACY Infocom 125 CambridgePark Drive Cambridge, MA 02140 (617) 492-6000 \$40 ©1987	The author of <i>The Hitchhiker's Guide to the Galaxy</i> turns his unique humor to an interactive adventure pitting players against the forces of everyday bureaucracy (e.g., banks).+ —MORGENSTERN	Reviewed on 128K Apple IIe/IIc. Also for Amiga, C 128, IBM PC,* Macintosh.	90-day warranty. \$5 thereafter. Not copy-protected.	★ ★ ★ N/A	★				★
DECEPTOR Avantage/Accolade, Inc. 20813 Stevens Cr. Blvd. Cupertino, CA 95014 (408) 446-5757 \$15 ©1986	A multilevel arcade game where you are Deceptor—capable of transforming yourself from a humanoid robot into a fighter plane or an armed vehicle. Exciting at first, but not exceptional. —DELSON	C 64/128. Joystick.	90-day warranty. \$10 thereafter. \$6 for backup.	★ ★ ★ ★ E	★				★
KING OF CHICAGO Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$50 ©1986	You play the part of a hoodlum bent on controlling Chi town, filling the power vacuum left by Al Capone's early "retirement." Adult language and situations, but it plays like a computer strip (dialogue in balloons). —DELSON	512K Macintosh. 800K drive required.	90-day warranty. \$21 thereafter or for backup.	★ ★ ★ ★ A	★				★
KING'S QUEST III Sierra On-Line, Inc. Sierra On-Line Building Coarsegold, CA 93614 (209) 683-6858 \$50 ©1986	A sequel in the popular graphic adventure series, this one pits a young servant against a wicked wizard. Challenging and fun for those who like to step into a magical cartoon world.+ —RHOADES	Reviewed on IBM PC/PCjr.* Also for Amiga, Atari ST, 512K Macintosh.	90-day warranty. \$5 thereafter.	★ ★ ★ ★ A	★				★
PHM PEGASUS Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$35-\$40 ©1987	A high-tech arcade game on the high seas that really delivers on action, but lacks depth. The bad guys are too easy to kill, while it's almost impossible to destroy your ship. —DELSON	Reviewed on Apple IIe/IIc, C 64/128. Joystick recommended.	90-day warranty. \$7.50 thereafter.	★ ★ ★ ★ A	★				★
REBELYELL Richardson Software P.O. Box 8153 San Antonio, TX 78208 (800) 531-5314 \$25 ©1986	Innovative game that recreates the Civil War on a grand strategic scale. You lead from one to four Southern armies to seize and control cities, threaten Washington, and defend Richmond. Ideal for war-game novices. —DELSON	IBM PC/PCjr.*	90-day warranty. Not copy-protected.	★ ★ ★ ★ A	★				★
SPACE QUEST Sierra On-Line, Inc. (see above for address and phone) \$50 ©1986	This funny graphic adventure combines arcade movement and combat with interactive encounters and 3-D scrolling screens. Easier to use than many games. —DELSON	Reviewed on Atari ST and IBM PC/PCjr.* Also for Amiga, 512K Macintosh. Joystick, mouse optional.	90-day warranty. \$5 thereafter.	★ ★ ★ ★ E	★				★
TRAILBLAZER Mindscape, Inc. (see above for address and phone) \$50 ©1986	Steer a ball along a path that stretches off into outer space. Fun, but similar to other arcade maze games, such as the superior Marble Madness. —DELSON	Reviewed on Atari, C 64/128. Joystick(s).	90-day warranty. \$12.50 thereafter or for backup.	★ ★ ★ ★ A	★				★
URIDIUM Mindscape, Inc. (see above for address and phone) \$30 ©1986	Takes the familiar scrolling shoot-'em-up in outer space and executes it with verve and style. Top-notch graphics and smooth joystick control. —MORGENSTERN	C 64/128. Joystick.	90-day warranty. \$12.50 thereafter or for backup.	★ ★ ★ ★ E	★				★
WORLD CLASS LEADERBOARD Access Software, Inc. 2561 S. 1560 West Woods Cross, UT 84087 (801) 298-9077 \$40 ©1987	Tremendous improvement in this major revision of the popular golf program. Features realistic courses complete with trees, sand traps, and water hazards. The swing is a fine test of hand-eye coordination. —MORGENSTERN	C 64/128. Joystick.	90-day warranty. \$10 thereafter or for security key. Not copy-protected.	★ ★ ★ ★ E	★				★

RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; □ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 48 for information such as backup policies and addresses of software publishers.

HOME BUSINESS & PRODUCTIVITY

Celebrity: Word Processor Plus

HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Good Software Corp.
PRICE: \$90

Celebrity bills itself as a "word processor plus," and pluses it has in abundance: a spelling checker, a thesaurus, a calculator, a calendar, and a data-processing feature that lets you save and retrieve information, then create reports with it. *Celebrity* even does windows—four of them at a time, each with a different word-processing file. *Celebrity* isn't the fastest program I've seen, and the extra features are uneven, but it offers quite a bit at an especially reasonable price.

Word-processing commands can be entered directly from a command line or from bar menus. The commands are words, rather than control characters, so it's easy to remember them. In addition, you can use the function keys and a set of CTRL- and ALT-key combinations to quickly execute some commands. *Celebrity* supports a broad selection of printers and lets you customize control codes for special effects.

The spelling checker has fewer options than some, but it will "guess" at correct spellings and automatically insert the word you choose. The thesaurus gives you a definition of the word as well as synonyms, but it won't look up words from the screen as do most on-line thesauruses.

The calendar is especially clever. As you enter appointments, it shows you a graph of the day's schedule so that you can see at a glance when the timing of events threatens to become too hectic. The calculator is less special; it includes such business features as annuities and loans, as well as scientific functions. For example, it can add a row of numbers in your document and then place the answer at the cursor.

Celebrity's weakest aspect is its

data manager. It offers only one kind of form, a complicated personal information sheet with fields for such information as social security number and birth date. You can't modify the form or create your own, so if you're cataloging rare manuscripts rather than tracking sales contacts, you'll be frustrated. Nevertheless, *Celebrity* offers both a good word processor and a set of desktop management tools at a price you might expect to pay for either kind of software alone. It's definitely no misnomer—*Celebrity* is word processing with a plus.

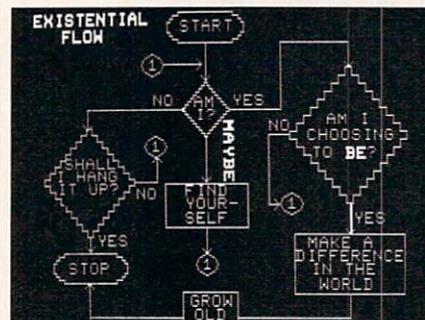
—TAN A. SUMMERS

Everybody's Planner

HARDWARE REQUIREMENTS: 64K Apple, 256K IBM PC
PUBLISHER: Abracadata
PRICE: \$100

To offer a worthwhile review of *Everybody's Planner*, two questions need to be answered first: What is a "planner," and who is "everybody"?

This program offers two different tools for project planning—that is,



all of the steps required to achieve any goal. The first, and simpler, tool is a flowchart builder. Most of us have seen flowcharts. They consist of a series of boxes, diamonds, and other shapes linked by lines, diagramming the way a process will proceed. Flowcharts are good for visualizing alternative paths—if the answer is "yes," take this turn on the chart; if "no," take the other. The program allows you to create a reasonably attractive flowchart, edit it if necessary, and print it out.

The other planning tool included is more helpful; it allows you to create schedules, also referred to as project plans. The project plan is made up of a series of tasks (jobs that have to be achieved) and milestones (completion points for stages in the overall plan).

A schedule in *Everybody's Plan-*

ner

ner

is a graphics-oriented tool. The individual tasks that must be undertaken are enclosed in boxes, including the number of days required by up to four separate workers or departments. When the tasks are linked in sequence, the program can then analyze the information entered. It will report on the expense of the overall project, the component steps in the project, or the individual resources involved. You can analyze slack time—days when resources are not being put to use within the project plan. You can distinguish the critical tasks (the ones that will hold up progress if they're not completed on time) from non-critical tasks. With a variety of report formats, the program makes it easier to keep track of time and money invested. And like a spreadsheet program, *Everybody's Planner* automatically recalculates all results when you edit the dates or tasks involved. If you fall behind early on, for example, you can enter the actual date this delayed task was completed, then see the effect on all subsequent steps.

Helpful capabilities to have, but there's still the second question to answer—that is, who is "everybody"? The program documentation suggests planning projects such as the school play or the annual company picnic. Well, perhaps a play, but not most tasks. Creating a schedule flowchart with this program is a lot of work, and most jobs simply don't justify the effort. It's only those undertakings with lots of people involved at different interrelated jobs that require the capabilities included here. This applies primarily to projects in the business world, where project-management software has become very popular (most of it, predictably enough, running on IBM PCs and clones). The creators of *Everybody's Planner* deserve praise for bringing these capabilities to the Apple II world, in a form that can be grasped within a few days of use.

— STEVE MORGENSEN

Guide

HARDWARE REQUIREMENTS: 512K Macintosh.
PUBLISHER: Owl International, Inc.
PRICE: \$135

Guide isn't easily categorized, and its subtitle—"Hypertext for the Macintosh"—probably doesn't help you,

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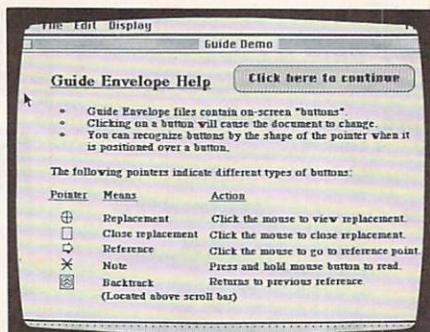
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SOFTWARE REVIEWS



either. "Three-dimensional word processor" is a phrase that comes to mind, but that's also not quite it.

Picture this: You're scrolling through what seems to be a word-processor document, and you see a heading in bold print. You click on the heading, and it's replaced by pages of descriptive text. Or, you click on an underlined word in the middle of a paragraph, and a separate window with footnote information pops up for as long as you hold down the mouse button. Or, you click on an italicized word and another part of the document—or another document entirely—is displayed because it was cross-referenced to the italicized word.

Guide doesn't want you to print out its documents (although you can); Guide works best as an on-screen-only information system. It's easy to create Guidelines, as the documents are called, and even easier to access the information in them. Working as you would in a word processor (although the editing capabilities are not as sophisticated), you can select and define text to act as "buttons"—which you subsequently click on to move to your related text or graphics. The mouse cursor changes shape any time it's positioned over a "button," so you know when and where to click if the text itself doesn't make it obvious.

And, because this is designed for the Macintosh, you can use graphics instead of, or in addition to, text. There's one sample on the disk that has a series of graphic buttons replacing one another; the net result is a continually magnified view of a certain section of a street map.

Guide's possibilities are endless—and awesome. For example, you could construct a Guideline for teaching automobile mechanics. With one, when a student clicks on the term carburetor, say, a cross-section diagram of a carburetor could appear on screen. Then, a click on

one of the carburetor's parts could bring up a description of that item.

The only problem with the current version is that if you make up a Guideline, other people can use it only if they have the Guide program to run it. To be really useful, Guide should let you make stand-alone Guidelines that anyone can read, without the main program. In fact, the publisher is coming out with a program that will turn Guidelines into stand-alones, called "Guide Envelope System."

Guide is special, but not perfectly useful as it stands. Guide and the new Envelope program will be both unique and useful, but somewhat expensive. If you're in business or education, or if you're doing any training, though, it may be well worth the price.

—SHARON ZARDETTO AKER

Nutshell 2.0

HARDWARE REQUIREMENTS: 256K IBM PC.

PUBLISHER: Nashoba Systems Inc.
PRICE: \$150

When I bought my first computer, I also brought home a database program. It was powerful and flexible, but it was hard to set up databases with it. I replaced it eventually with a simpler file manager. Unfortunately, that program, although easy to set up, couldn't manipulate my information in all the ways I needed. Now I've found Nutshell.

In the army of databases, Nutshell falls somewhere between the heavy artillery and the foot soldiers. You can store as many records in each file as disk space permits, but you can't work with multiple files as you can with programs like dBase III. Yet it's as easy to set up a database with Nutshell as with PFS: File—and once you've entered data, Nutshell lets you do much more with it.

Fields of information can be designated as text, numbers, or dates; or they can contain mathematical calculations up to 80 characters long. Information can be sorted on as many fields as there are in the record, instead of just one or two fields like many other "easy" programs allow. Data fields can be moved into any position on the screen and the field size can be changed whenever you want.

Even if you're still new to computers, you can use Nutshell; extremely well-organized documentation and

SOFTWARE REVIEWS

thoughtful programming let you get off to a quick start. Menus and on-screen help walk you through procedures. Later, when you're familiar with the program, you can bypass the menus and directly enter commands.

Once your data is entered, it's easy to retrieve. You can find a group of records just by entering part of a matching word or view an alphabetized index showing every word stored for a given field in any record. You can display as many or as few fields as you want for whatever part of the database you need to see. While advanced users cannot program their own automatic procedures, you can use modifiers such as "greater than/less than" or a range of "from . . . to" to perform simple searches.

It's more than adequate for most small business uses and for any amateur cataloging tasks you might set for it. My only complaint is that *Nutshell* wasn't invented sooner.

—TAN A. SUMMERS

EDUCATION/ FUN LEARNING

Mimi Goes to Town

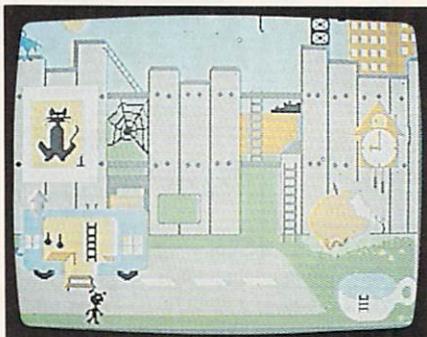
HARDWARE REQUIREMENTS: C 64/128.

PUBLISHER: Logidisque, Inc.

PRICE: \$35

PUBLISHER'S SUGGESTED AGES: 5 +

For those of you who may have missed the first *Mimi* program, *Mimi* is a clever and cute animated



ant who—at the behest of the computer user—is able to perform a surprising number of tricks. In *Mimi Goes to Town*, the intrepid ant sets up her little trailer home in a city alleyway and from there launches on a series of adventures with the new friends she meets.

Young users merely need to press a single key on the keyboard to

launch Mimi into a little scenario that is connected (all too loosely, on occasion) to the letter of the alphabet that has been pressed. For example, pressing "B" will send Mimi excitedly off after her bowling pins, which she sets up and then happily knocks down with a bowling ball. Some of the connections between the key presses and the resulting actions are slightly esoteric, though, such as the press of an "E," which causes a lighted match to fall from the sky, which Mimi quickly dunks in her teacup swimming pool. (The "E" stands for "Emergency," I learned, when in my befuddlement, I consulted the user's manual.)

Altogether, there are 26 different animated scenarios, each accompanied by bouncy and attractive music. The graphics are sophisticated and will hold a young child's attention, even on repeated viewings. As keys are pressed in sequence, a clock advances, making the sky lighten and darken and a moon appear. Even the number keys are at work here, as pressing each one causes a poster containing a corresponding number of objects to appear on a wall. The number keys also provide a simple 10-note synthesizer for making your own music.

Once a youngster becomes comfortable with the program, it's fairly simple to record and save to disk the sequences of animations to create mini-*Mimi* movies. There are also three games included—a volleyball game, a "fence" game (in which the user directs Mimi up a series of rickety ladders and railings to finally stand next to her friend, a cuckoo), and a magician game.

Younger players, and those not yet comfortable with a computer keyboard, will need some adult supervision the first few times *Mimi* is booted. Two-year-old Sarah was mostly an observer of this program, but six-year-old Rachel quickly understood the ropes. And both girls really enjoyed watching the little animated ant as she moved through her clever paces.

—DEBORAH KOVACS

ENTERTAINMENT

King's Quest III

HARDWARE REQUIREMENTS: Amiga, Atari ST, 256K IBM PC/PCjr, 512K Macintosh.

PUBLISHER: Sierra On-Line, Inc.

PRICE: \$50

Considering the popularity of movie sequels, it should come as no surprise to find sequels to computer entertainment software. Now in its third—and best—go-round, *King's Quest III* tells a tale of magic and



sorcery involving Gwydion, young servant to an evil wizard named Manannan.

Set in the mythical land of Llewdor, you (as Gwydion) explore the wizard's castle and its secret passages, climb down perilous mountain trails, wander a desert, set sail on the high seas, and even soar like an eagle. Along the way, you'll encounter robbers, a Medusa who can turn you to stone, the Abominable Snowman, and the Three Bears of storybook fame.

But your greatest threat is the nasty old wizard himself.

Each sequel in this series seems to add new challenges; in this one, the game turns into an electronic scavenger hunt as you gather the ingredients for magical spells. For instance, in order to "brew a storm," the ancient spellbook calls for one cup of ocean water, one spoonful of mud, one pinch of toadstool powder, an empty jar, and—of course—a magic wand.

My friend Robert and I (*King's Quest* veterans) found this to be the most challenging adventure yet. Like two grown-up kids, we play after work on our office computers, consult with neighborhood kids on the weekends, and swap tips in elevators to the puzzlement of less adventurous co-workers. Our winning advice: Pick up anything that isn't nailed down, whether it be a dead fly, chicken feathers, or the Baby Bear's porridge.

But whatever you do, work fast. The wizard usually shows up to zap you when the clock reaches 30 minutes.

—SHIRREL RHOADES

Bureaucracy

HARDWARE REQUIREMENTS: Amiga, 128K Apple IIe/IIc, C 128, IBM PC, Macintosh.

PUBLISHER: Infocom

PRICE: \$40

You've just gotten a fantastic new job and an appropriately fantastic new home as well. Not only that, your fantastic new employer is about to send you off for two week's training—all expenses paid—in Paris! Wow! All you have to do is take your expense check (it should be in today's mail) over to the bank, grab a bite to eat, take a cab to the airport, and it's off to Paris.

Unfortunately, the bank never processed your change of address form, so the check doesn't show up—and from that seed of bureaucratic bungling Douglas Adams spins an interactive tale of extraordinary complexity and uncommon strangeness, involving computers, cannibals, llamas, fast food, and air traffic controllers, although not necessarily in that order.

The game's puzzles vary widely in difficulty; some are absolutely a snap, while others are mind-bog-

glingly obscure, and bring you to a dead stop until you solve them. There also seems to be an unusual number of red herrings in this game—people, objects, or strategies that seem promising and can lure you into spending hours trying to use them, but ultimately prove to have been merely side issues.

While the puzzles drift into the realm of unfairness from time to time, the quality of the writing is consistently excellent. While not quite as funny as Adams's previous game, *The Hitchhiker's Guide to the Galaxy*, it's a genuine pleasure to read *Bureaucracy*. The author taps into a rich vein of popular paranoia, skewering petty annoyances such as rude waiters and interminably complex airline terminals while reminding us that "just because you're a paranoid doesn't mean they aren't out to get you."

Have a hint book or a few imaginative friends handy while you play *Bureaucracy*. It doesn't quite live up to the lofty standards set by its best-selling predecessor, but it's still far more entertaining than 97 percent of the software on the shelves.

— STEVE MORGENTERN

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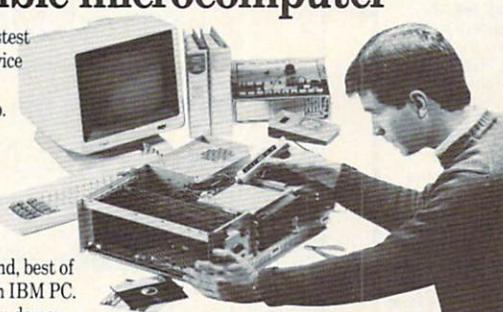
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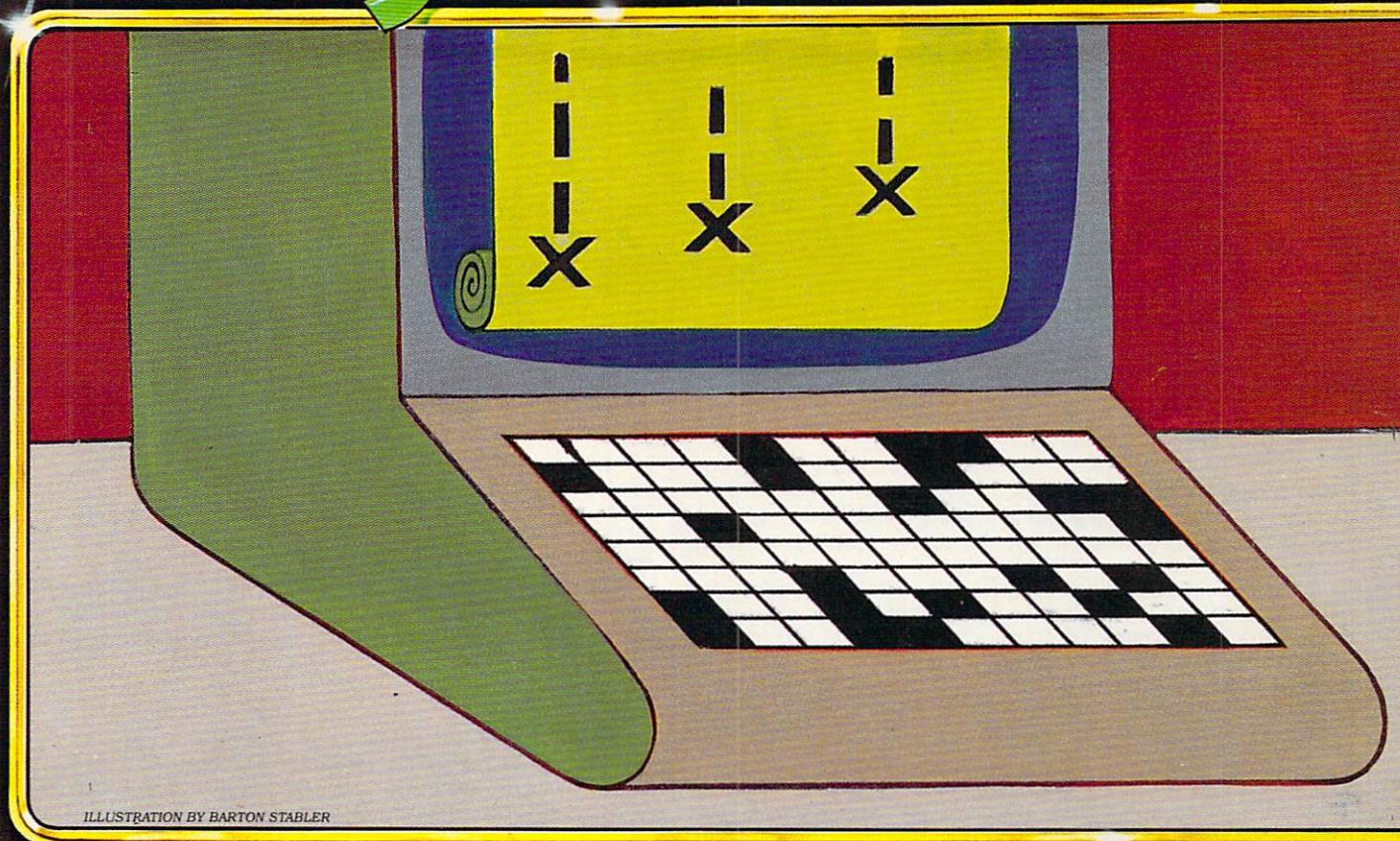


ILLUSTRATION BY BARTON STABLER

A U G U S T

FYI

Page 60

Useful information about our programs, including program coverage and testing and Programming P.S.

FUN-AND-GAMES PROGRAM

Page 61

Crisscross the galaxy to rescue stalled space taxis in the year '2030.

PUZZLE

Page 64

Try our latest Crossword Puzzler.
PLUS: solution to last month's puzzle.

UTILITY PROGRAM

Page 73

Reverse Scroller will enable you to scroll text down the screen instead of up.

MICROTONES

Page 75

Add rich and random sounds to your own programs with Three-Voice Sound Effect.

ILLUSTRATION BY JAMES CHERRY III

cherry

THIS MONTH'S PROGRAM COVERAGE

Computers*	Criss-cross (pg 61)	Crossword Puzzler (pg 64)	Puzzle Clues (pg 66)	Reverse Scroller (pg 73)	Three-Voice Sound Effects (pg 75)
Adam		★	★		
Apple IIgs	★ j	★ D p	★	★	
Apple II series	★ j	★ D p	★	★	
Atari 800/XL/XE		★ D p	★	★	★
Commodore 64/128	★ j	July '87	★	★	★
IBM PC FAMILY					
IBM PC	★ j	July '87	★	★	
IBM PCjr.	★ j	July '87	★	★	★ T
IBM PS/2 Model 30	★ j	July '87	★	★	
IBM PC COMPATIBLES					
Blue Chip	★ j	July '87	★	★	
Commodore PC 10	★ j	July '87	★	★	
Epson Equity I	★ j	July '87	★	★	
Kaypro PC-10	★ j	July '87	★	★	
Leading Edge Model D	★ j	July '87	★	★	
Panasonic FX600	★ j	July '87	★	★	
Tandy 1000/EX/SX	★ j	July '87	★	★	★ T
Macintosh		★ p	★	★	
Tandy Color Computer	★ j	July '87	★		
TI-99/4A			★		

KEY ★ Program in this issue for this computer. D Disk drive required. j joystick optional. p printer optional. T Television or monitor with external speaker required for IBM PCjr and Tandy 1000 only. *see below for specific models.

THE SYSTEMS WE TEST ON

Every FAMILY COMPUTING program is thoroughly tested before publication. The exact systems we use during the testing process are listed here. While you can be sure that a program will work if your system matches ours, a comparable system configuration should also work. For example, even though we do not test on the Franklin Ace, Apple programs should work on this system. Any exception to the following hardware/software configurations will be listed in the chart above. Systems that do not have a specific printer listed were tested with Epson FX-80 printers when a printer option was available.

Adam w/80K RAM, Coleco SmartBASIC V1.0, disk enhanced by MMSG, Coleco disk drive, AdamDOS, and color monitor. **Apple IIe** in 40-column mode w/64K RAM, DOS 3.3, two disk drives, MPC parallel printer interface, monochrome and color monitor. Apple programs should also work on Apple IIc/II Plus. **Apple IIgs** w/1MB RAM, one 3.5" and one 5.25" disk drive, ProDOS 3.3, and Apple RGB monitor. **Atari 800XL** w/two disk drives, DOS II version 2.05, Atari 850 interface, and color monitor. Atari programs should also work on Atari 800(w/48K), 1200XL, 65/130XE. Smaller programs should work on Atari 400 & 600XL. **Commodore 128** in C 64 mode with two 1571 disk drives, color monitor, and Micrografx parallel graphics interface. Programs should also work on Commodore 64/64C/128D. **IBM PC** w/640K RAM, Disk BASIC D2.00, IBM Monochrome Display and Printer Adapter, monochrome monitor, IBM Color/Graphics Monitor Adapter, RGB monitor, AST Sixpack Plus, and IBM PC DOS 3.10. **IBM PCjr** w/128K RAM, one disk drive, IBM PC DOS 2.10, cartridge BASIC J1.00. **IBM PS/2 Model 30** w/640K RAM, one floppy and one hard-disk drive, RGB monitor, IBM PC DOS 3.30, and IBM PC BASIC A3.30. **Macintosh** w/512K RAM, two disk drives, Microsoft BASIC 2.1, and ImageWriter printer. Macintosh programs should also work on 128K Mac/Mac Plus/SE/II, and under Microsoft BASIC 2.0. **Tandy Color Computer 2** w/64K RAM, Disk Extended Color BASIC 1.1, two disk drives, Bolek serial to parallel printer interface, color monitor. It should also work on Color Computer 1 (w/64K) and 3. **TI-99/4A** w/8K RAM, peripheral expansion system, disk drive, RS232 Interface Card, and TI-99/4 Impact Printer.

The following PC compatibles have been added to our testing list. IBM PC programs should also work on other PC compatibles w/at least 128K.

Blue Chip w/512K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Commodore PC-10** w/640K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Epson Equity I** w/256K RAM, two disk drives, monochrome display adapter, monochrome monitor, MS-DOS 3.10, GW-BASIC 3.10. **Kaypro PC 10** w/640K RAM, two disk drives, RGB monitor, MS-DOS 2.11, GW-BASIC 2.02. **Leading Edge**

Model D w/640K RAM, two disk drives, monochrome and RGB monitors, MS-DOS 3.10, GW-BASIC 3.11. **Panasonic FX600** w/640K RAM, two disk drives MS-DOS 3.10, GW-BASIC 3.10, enhanced graphics adapter, RGB monitor. **Tandy 1000** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.22, GW-BASIC 2.02 version 01.01.00, RGB monitor. **Tandy 1000 EX** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.24, GW-BASIC 2.02 version 01.02.00, RGB monitor. **Tandy 1000 SX** w/384K RAM, two disk drives, MS-DOS 3.20 version 03.20.00, GW-BASIC 3.20 version 03.20.00, RGB monitor.

(212) 505-3703

A HELP LINE FOR PROGRAM PROBLEMS

Call our Program Status Line any time of day or night to receive an up-to-date summary of our latest programs, the machines on which they run, and any corrections or enhancements to the programs.

PROGRAMMING P.S.

Corrections to Previous Months' Programs

Micro Phonebook (May 1987, page 66)

Apple II series: Often, the program doesn't sort correctly. To fix the sorting feature, change lines 1030 and 1040 to read as follows:

```
1030 PBS(V,Y) = VS:NEXT Y
1040 NEXT V:NEXT U:A = FRE(0):GOTO 90
```

Home Message Center (June 1987, page 66)

IBM PC & compatibles w/128K RAM & disk

drive: Due to a printer error, lines 2010 and 2020 did not print clearly. The lines should read as follows:

```
2010 PRINT " Re: ";MC$(X,3)
2020 PRINT " Date: ";MC$(X,4); Time: ";MC$(X,5)
```

A/C Sizer (July 1987, page 62)

IBM PC compatibles: On some PC compatibles, the statement WIDTH 40 produces an Illegal Function Call error. If you have this problem, change line 30 to read as follows:

```
30 KEY OFF
```

Crossword Puzzler (July 1987, page 69)

Tandy 1000/EX/SX: The CTRL-S command suspends program execution on the Tandy 1000/EX/SX, so CTRL-F must be used to SAVE puzzles. To make this version SAVE properly, change lines 180, 190, 560, and 1390 to read as follows:

```
180 CS=="BAEDPF":W=0:IF MS=2 THEN 210
190 GOSUB 3000:GOTO 390
560 PRINT TAB(4);<CTRL>+<F>=Save & Return to Menu"
1390 MS=4:W=1:CS=="EAFDP":GOTO 390
```

BUG IN TANDY BASIC

While testing our programs at FAMILY COMPUTING, we ran across a bug in the new BASIC for the Tandy 1000 EX and Tandy 1000 SX. Any BASIC program using the PLAY statement may lock up the system depending on the notes being played. For information on how to fix this problem, contact your local Tandy Training and Support Center.

NEW BASIC FOR MS-DOS

Microsoft Corp. recently introduced QuickBASIC 3.0, an advanced BASIC compiler that is substantially faster than the earlier version 2.0. With its improved speed, fully integrated debugger, and new extensions to the BASIC language, BASIC users now have access to many advanced programming capabilities previously available only to C and Pascal programmers. QuickBASIC 3.0 lists for \$99, but registered users of earlier versions of QuickBASIC 2.0 can upgrade for a small fee. For more information, contact Microsoft Customer Service, 16011 NE 36th Way, Box 97017, Redmond, WA 98073-9717.

CRISSCROSS

BY JOEY LATIMER

The year is 2030. The orbital zones are crowded with space taxis, and your job is simple: Avoid the crisscrossing space traffic and maneuver your sluggish towing craft (pictured as an asterisk on your video screen) to aid stalled taxis (marked by an "X"). You can move your craft around by using a joystick or by pressing the following keys: "I" (up), "M" (down), "K" (right), and "J" (left). The more stalled taxis you reach, the more points you will earn toward the honorary OTOY (Orbital Tow Operator of the Year) award. But if you're struck by a crisscrossing space taxi, you lose your chance at the prestigious award. Your points are totaled, and you're given a choice of quitting or playing again.

PROGRAMMING NOTES: The Crisccross game has several shapes moving (made with characters) on the screen at one time, which is very difficult to accomplish with adequate speed

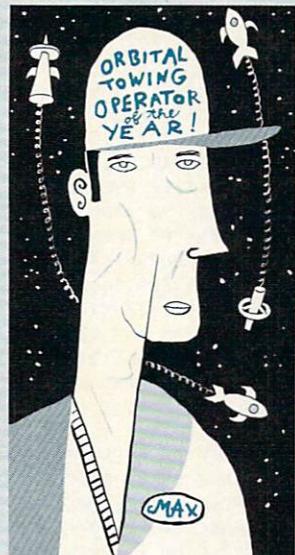


ILLUSTRATION BY JOSH GOLDBECK

in BASIC. The "secret" to all this movement is the frequently called subroutine starting at line 1000. This routine updates the movements of each of the four space taxis and checks for collisions as well.

Except in the IBM & compatibles version, you can modify the program so that other keys control the movement of your towing craft. Just change line 20, replacing I, J, K, and M with any keys you want.

Apple II series/Crisccross

```

20 UPS = "I":WNS = "M":LES = "J":RI$ = "K"
30 UP = ASC(UPS):WN = ASC(WNS)
40 LE = ASC(LES):RI = ASC(RIS)
50 PLS = CHR$(42):SS = CHR$(32):SP$ = SS+SS+SS
60 SQ$ = SS:SK$ = "<"+CHR$(255)+">":XX$ = CHR$(88)
70 FOR X = 1 TO 28:TB$ = TB$+SQ$:NEXT X:HS = 0
80 FOR X = 768 TO 796:READ ML:POKE X,ML:NEXT X
90 HOME:PRINT
100 PRINT "DO YOU WANT TO USE THE <K>EYBOARD,"
110 PRINT "OR A <J>OYSTICK?"
120 JK = PEEK(-16384):IF JK < 128 THEN 120
130 JK$ = CHR$(JK-128):IF JK$ <> "J" AND JK$ <> "K" THEN 120
140 POKE -16388,0:JK = 0:IF JK$ = "J" THEN JK = 1
150 X1 = INT(RND(1)*4)+8:Y1 = INT(RND(1)*3)+6
160 X2 = INT(RND(1)*8)+23:Y2 = INT(RND(1)*6)+13
170 X3 = INT(RND(1)*4)+8:Y3 = INT(RND(1)*3)+6
180 X4 = INT(RND(1)*8)+23:Y4 = INT(RND(1)*6)+13
190 CO = INT(RND(1)*8)+15:RO = INT(RND(1)*6)+6
200 A1 = X1:A2 = X2:A3 = X3:A4 = X4
210 B1 = Y1:B2 = Y2:B3 = Y3:B4 = Y4
220 H1 = CO:H2 = RO:S = 0:FL = 0:PS = HS
230 HOME:PRINT TAB(10);"-THE CRISCCROSS GAME-"

```

```

240 VTAB 22:HTAB 2
250 IF JK = 1 THEN PRINT TAB(4);;"USE A JOYSTICK TO MOVE YOUR PLAYER.":GOTO 270
260 PRINT "<";UP$;">=UP <";WN$;">=DOWN <";LE$;">=LEFT <";RI$;">=RIGHT"
270 PRINT TAB(2);;"REACH THE SPOT MARKED X TO EARN POINTS."
280 VTAB 4:HTAB 7:INVERSE:PRINT TB$
290 VTAB 20:HTAB 7:PRINT TB$
300 FOR X = 4 TO 19:VTAB X:HTAB 7:PRINT SQ$;
310 VTAB X:HTAB 34:PRINT SQ$;:NEXT X
320 NORMAL:VTAB RO:HTAB CO:PRINT PL$;
330 VTAB 3:HTAB 8
340 PRINT "HIGH SCORE: ";HS;" SCORE: ";SC;
350 G1 = INT(RND(1)*19)+8
360 G2 = INT(RND(1)*14)+6:IF G2 = RO THEN 360
370 GOSUB 1000:IF FL THEN 530
380 IF JK = 1 THEN 430
390 K = PEEK(-16384):IF K < 128 THEN 370
400 K = K-128:POKE -16368,0
410 CO = CO-(K = LE)+(K = RI)
420 RO = RO-(K = UP)+(K = WN):GOTO 460
430 KX = (PDL(0) > 192)-(PDL(0) < 64)
440 KY = (PDL(1) > 192)-(PDL(1) < 64)
450 RO = RO+KY:CO = CO+KX
460 VTAB H2:HTAB H1:PRINT SS;
470 SR = SCR(N(CO-1,2*RO-1)+16*SCR(N(CO-1,2*(RO-1)+1)-12
8:IF SR <> 42 AND SR <> 93 THEN 530
480 VTAB RO:HTAB CO:PRINT PL$;
490 H1 = CO:H2 = RO
500 IF CO <> G1 OR RO <> G2 THEN 370
510 SC = SC+S:S = S+10:X = 5:IF SC > HS THEN HS = SC
520 GOSUB 2000:GOTO 330
530 FOR X = 1 TO 20:VTAB RO:HTAB CO
540 PRINT CHR$(INT(RND(1)*2)+42):GOSUB 2000:NEXT X
550 HOME:VTAB 8:HTAB 8:PRINT "SORRY, YOU WERE ZAPPED!"
560 IF SC <= PS THEN 600
570 PRINT
580 PRINT "CONGRATULATIONS! YOU WIN THE OTOY AWARD!"
590 PRINT TAB(6);;"FOR BREAKING THE HIGH SCORE!"
600 HS = SC:PRINT
610 IF JK = 0 THEN PRINT TAB(8);;"PRESS <P> TO PLAY AGAIN.":GOTO 630
620 PRINT TAB(4);;"PRESS FIRE BUTTON TO PLAY AGAIN."
630 PRINT TAB(9);;"OR PRESS <Q> TO QUIT."
640 IF JK = 1 THEN IF (PEEK(-16286) > 127) OR (PEEK(-16287) > 127) THEN 150
650 KY = PEEK(-16384):IF KY < 128 THEN 640
660 KS$ = CHR$(KY-128)
670 IF KS$ <> "Q" AND KS$ <> "P" THEN 640
680 IF KS$ = "P" THEN 150
690 POKE -16368,0:HOME:END
700 X1 = X1+1
710 IF X1 > 31 THEN X1 = 8:Y1 = INT(RND(1)*13)+6
720 IF X2 > 8 AND Y2 > 5 THEN X2 = X2-1:Y2 = Y2-1:GOT 0 1040
730 X2 = INT(RND(1)*24)+8:Y2 = 19
740 IF Y3 < 19 AND X3 < 30 THEN X3 = X3+1:Y3 = Y3+1:GOT 0 1060
750 X3 = INT(RND(1)*24)+8:Y3 = 5
760 Y4 = Y4-1
770 IF Y4 < 5 THEN Y4 = 19:X4 = INT(RND(1)*23)+8
780 VTAB RO:HTAB CO:PRINT PL$;
790 VTAB B1:HTAB A1:PRINT SP$;
800 VTAB Y1:HTAB X1:PRINT SK$;
810 VTAB B2:HTAB A2:PRINT SP$;
820 VTAB Y2:HTAB X2:PRINT SK$;
830 VTAB B3:HTAB A3:PRINT SP$;
840 VTAB Y3:HTAB X3:PRINT SK$;
850 VTAB B4:HTAB A4:PRINT SP$;
860 VTAB Y4:HTAB X4:PRINT SK$;
870 A1 = X1:B1 = Y1:A2 = X2:B2 = Y2
880 A3 = X3:B3 = Y3:A4 = X4:B4 = Y4
890 FF = SCR(N(G1,2*G2)+16*SCR(N(G1,2*G2+1))

```

FUN-AND-GAMES PROGRAM

```

1200 IF FF = 24 THEN 1220
1210 VTAB G2:HTAB G1:PRINT XX$;
1220 FL = ((SCRN(CO-1,2*RO-1)+16*SCRN(CO-1,2*(RO-1)+1)
-128) <> 42):RETURN
2000 POKE 8,X+45:POKE 6,2:CALL 768:RETURN
3000 DATA 165,8,74,133,10,164,8,173,48,192,136,234
3010 DATA 234,208,251,165,7,56,229,10,133,7,176,237
3020 DATA 198,6,208,233,96

```

Commodore 64 & 128 (C 64 mode)/Crisscross

```

10 DIM KS$(4)
20 UP$="I":WN$="M":LES$="J":RI$="K"
30 UP=ASC(UP$):WN=ASC(WN$):LE=ASC(LE$):RI=ASC(RI$)
40 DN=51164:MV=49700:OV=51163:SB=1024:SD=54272:HS=0
50 PL$=CHR$(154)+CHR$(42):SS=CHR$(32):SP$=SS+$S+$S
60 SQ$=CHR$(18)+SS:TB$=CHR$(129)
70 FOR X=1 TO 28:TB$=TB$+SQ$:NEXT X
80 XX$=CHR$(5)+CHR$(88):S2$=SQ$+CHR$(17)+CHR$(157)
90 SI$=CHR$(129):FOR X=1 TO 17:SI$=SI$+S2$:NEXT X
100 FOR X=1 TO 4:READ Y
110 K$(X)=CHR$(Y)+"<"+SQ$+CHR$(146)+">":NEXT X
120 FOR X=49700 TO 49710:READ ML:POKE X,ML:NEXT X
130 FOR X=SD TO SD+23:POKE X,0:NEXT X
140 POKE SD+24,15:POKE SD+5,68:POKE SD+6,68
150 PRINT CHR$(147)
160 PRINT "DO YOU WANT TO USE THE <K>EYBOARD,"
170 PRINT "OR A <J>OYSTICK PLUGGED INTO PORT 1?"
180 GET JK$:IF JK$<>"J" AND JK$<>"K" THEN 180
190 POKE 53281,0:POKE 53280,0:POKE 650,128:POKE 198,0
200 X1=INT(RND(1)*8)+6:Y1=INT(RND(1)*6)+5
210 X2=INT(RND(1)*8)+24:Y2=INT(RND(1)*6)+13
220 X3=INT(RND(1)*8)+6:Y3=INT(RND(1)*6)+5
230 X4=INT(RND(1)*8)+24:Y4=INT(RND(1)*6)+13
240 CO=INT(RND(1)*8)+15:RO=INT(RND(1)*6)+13
250 A1=X1:A2=X2:A3=X3:A4=X4:B1=Y1:B2=Y2:B3=Y3:B4=Y4
260 H1=CO:H2=RO:S=10:SC=0:FL=0:PS=HS
270 PRINT CHR$(147),CHR$(5),TAB(9);"-THE CRISSCROSS GA
ME-"
280 POKE OV,1:POKE DN,22:SYS MV
290 IF JK$="J" THEN PRINT TAB(3);"USE A JOYSTICK TO MO
VE YOUR PLAYER.":GOTO 310
300 PRINT "<;UP$;>=UP <;WN$;>=DOWN <;LES$;>=LEF
T <;RIS$;>=RIGHT"
310 PRINT "REACH THE SPOT MARKED X TO EARN POINTS.";
320 POKE OV,6:POKE DN,4:SYS MV:PRINT TB$
330 POKE OV,6:POKE DN,20:SYS MV:PRINT TB$
340 POKE OV,5:POKE DN,4:SYS MV:PRINT SI$
350 POKE OV,34:POKE DN,4:SYS MV:PRINT SI$
360 POKE OV,CO:POKE DN,RO:SYS MV:PRINT PL$;
370 POKE OV,7:POKE DN,2:SYS MV
380 PRINT CHR$(159),"HIGH SCORE:";HS;" SCORE:";SC
390 G1=INT(RND(1)*19)+8
400 G2=INT(RND(1)*14)+6:IF G2=RO THEN 400
410 GOSUB 1000:IF FL THEN 560
420 IF JK$="J" THEN 460
430 GET K$:IF K$="" THEN 410
440 K=ASC(K$):CO=CO-(K=RI)+(K=LE)
450 RO=RO-(K=WN)+(K=UP):GOTO 490
460 K=15-(PEEK(56321) AND 15):IF K=0 THEN 410
470 CO=CO-(K>8 AND K<=10)+(K>4 AND K<=6)
480 RO=RO-(K=2 OR K=6 OR K=10)+(K=1 OR K=5 OR K=9)
490 POKE OV,H1:POKE DN,H2:SYS MV:PRINT SS;
500 IF PEEK(SB+CO+40*RO)>42 THEN 560
510 POKE OV,CO:POKE DN,RO:SYS MV:PRINT PL$;
520 H1=CO:H2=RO
530 IF CO>G1 OR RO>G2 THEN 410
540 SC=SC+S:S=S+10:X=5:IF SC>HS THEN HS=SC
550 GOSUB 2000:GOTO 370
560 PRINT CHR$(18):FOR X=1 TO 20
570 POKE OV,CO:POKE DN,RO:SYS MV
580 PRINT CHR$(INT(RND(1)*2)+42):GOSUB 2000:NEXT X
590 POKE OV,G1:POKE DN,G2:SYS MV:PRINT SP$

```

```

600 PRINT CHR$(147):POKE OV,8:POKE DN,8:SYS MV
610 PRINT CHR$(159);SORRY, YOU WERE ZAPPED!":PRINT
620 IF SC=>PS THEN 660
630 PRINT "CONGRATULATIONS! YOU WIN THE OTOY AWARD"
640 PRINT " FOR BREAKING THE CURRENT HIGH SCORE."
650 HS=SC:PRINT
660 IF JK$="K" THEN PRINT TAB(7);" PRESS <P> TO PLAY A
GAIN, ":"GOTO 680
670 PRINT TAB(3);" PRESS FIRE BUTTON TO PLAY AGAIN, "
680 PRINT TAB(8);" OR PRESS <Q> TO QUIT. "
690 GET K$:IF PEEK(56321)=239 THEN 200
700 IF K$<>"Q" AND K$<>"P" THEN 690
710 IF K$="P" THEN 200
720 PRINT CHR$(147):POKE 650,0
730 POKE 53280,14:POKE 53281,6:END
1000 X1=X1+1:IF X1>31 THEN X1=6:Y1=INT(RND(1)*15)+5
1010 IF X2>6 AND Y2>5 THEN X2=X2-1:Y2=Y2-1:GOTO 1030
1020 X2=INT(RND(1)*26)+6:Y2=19
1030 IF Y3<19 AND X3<31 THEN X3=X3+1:Y3=Y3+1:GOTO 1050
1040 X3=INT(RND(1)*26)+6:Y3=5
1050 Y4=Y4-1:IF Y4<5 THEN Y4=19:X4=INT(RND(1)*26)+6
1060 POKE OV,A1:POKE DN,B1:SYS MV:PRINT SP$;
1070 POKE OV,X1:POKE DN,Y1:SYS MV:PRINT K$(1);
1080 POKE OV,A2:POKE DN,B2:SYS MV:PRINT SP$;
1090 POKE OV,X2:POKE DN,Y2:SYS MV:PRINT K$(2);
1100 POKE OV,A3:POKE DN,B3:SYS MV:PRINT SP$;
1110 POKE OV,X3:POKE DN,Y3:SYS MV:PRINT K$(3);
1120 POKE OV,A4:POKE DN,B4:SYS MV:PRINT SP$;
1130 POKE OV,X4:POKE DN,Y4:SYS MV:PRINT K$(4);
1140 A1=X1:B1=Y1:A2=X2:B2=Y2:A3=X3:B3=Y3:A4=X4:B4=Y4
1150 IF PEEK(SB+G1+40*G2)=24 THEN 1170
1160 POKE OV,G1:POKE DN,G2:SYS MV:PRINT XX$;
1170 FL=(PEEK(SB+CO+40*RO)>42):RETURN
2000 POKE SD+4,129:POKE SD+1,X:POKE SD,30
2010 POKE SD+4,128:RETURN
3000 DATA 150,153,158,156
4000 DATA 174,220,199,172,219,199,24,32,240,255,96

```

IBM PC & compatibles/Crisscross

```

10 DEF SEG=$H40:IF (PEEK($H10)AND 48)=32 THEN WIDTH 40
20 KEY OFF:SCREEN 0,1,0,0:HS=0
30 RANDOMIZE TIMER:STRIG ON
40 F$=CHR$(0):UP$=F$+"H":WN$=F$+"P"
50 LES$=F$+"K":RI$=F$+"M"
60 PL$=CHR$(42):SS=CHR$(32):SP$=SS+$S+$S
70 SQ$=CHR$(219):SK$="<"+SQ$+">"
80 TB$=STRINGS(28,SQ$):XX$=CHR$(88)
90 CLS:PRINT:COLOR 7,0,0
100 PRINT "Do you want to use the <K>eyboard,"
110 PRINT "or a <J>oystick?"
120 Z$=INKEY$:IF Z$="" THEN 120
130 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123))
140 IF Z$<>"J" AND Z$<>"K" THEN 120
150 IF Z$="J" THEN JK=1 ELSE JK=0
160 X1=INT(RND(1)*4)+7:Y1=INT(RND(1)*3)+6
170 X2=INT(RND(1)*8)+23:Y2=INT(RND(1)*6)+13
180 X3=INT(RND(1)*4)+7:Y3=INT(RND(1)*3)+6
190 X4=INT(RND(1)*8)+23:Y4=INT(RND(1)*6)+13
200 CO=INT(RND(1)*8)+15:RO=INT(RND(1)*6+6)
210 A1=X1:A2=X2:A3=X3:A4=X4:B1=Y1:B2=Y2:B3=Y3:B4=Y4
220 H1=CO:H2=RO:S=10:SC=0:FL=0
230 CLS:PRINT TAB(9);"-THE CRISSCROSS GAME-"
240 LOCATE 22,1:COLOR 14,0,0
250 IF JK=1 THEN PRINT TAB(3);"Use a joystick to move
your player.":GOTO 270
260 PRINT "Use the cursor keys to move your player."
270 PRINT TAB(3);"Reach the spot marked X to earn poin
ts.:";
280 LOCATE 4,6:COLOR 4,0,0:PRINT TB$
290 LOCATE 20,6:PRINT TB$

```

```

300 FOR X=4 TO 19:LOCATE X,6:PRINT SQ$;
310 LOCATE X,33:PRINT SQ$;:NEXT X
320 LOCATE RO,CO:COLOR 7,0,0:PRINT PL$;
330 LOCATE 3,7:COLOR 3,0,0
340 PRINT "HIGH SCORE:";HS;" SCORE:";SC;
350 G1=INT(RND(1)*19+8)
360 G2=INT(RND(1)*14)+6:IF G2=RO THEN 360
370 GOSUB 1000:IF FL THEN 520
380 IF JK=1 THEN 430
390 K$=INKEY$:IF K$="" THEN 370
400 DEF SEG=$:POKE 1050,PEEK(1052)
410 CO=CO-(K$=RI$)+(K$=LE$)
420 RO=RO-(K$=WN$)+(K$=UP$):GOTO 450
430 KX=STICK(0):KY=STICK(1)
440 CO=CO+(KX<24)-(KX>72):RO=RO+(KY<24)-(KY>72)
450 LOCATE H2,H1:PRINT $;
460 SR=SCREEN(R0,CO):IF SR>42 AND SR<88 THEN 520
470 LOCATE R0,C0,0:COLOR 7,0,0:PRINT PL$;
480 H1=C0:H2=R0
490 IF CO<>G1 OR RO<>G2 THEN 370
500 SC=SC+S:S=S+10:X=5:IF SC>HS THEN HS=SC
510 GOSUB 2000:GOTO 330
520 FOR X=1 TO 20:LOCATE R0,C0
530 CR=INT(RND(1)*15)+1:IF CR=1 OR CR=9 THEN 530
540 COLOR CR:PRINT CHR$(INT(RND(1)*2)+42)
550 GOSUB 2000:NEXT X
560 CLS:LOCATE 9,8:COLOR 12,0,0
570 PRINT "Sorry, you were zapped!"
580 IF SC<=PS THEN 620
590 PRINT:COLOR 7
600 PRINT "CONGRATULATIONS! You win the OTOY award"
610 PRINT TAB(6);:"for breaking the high score!":HS=SC
620 PRINT:COLOR 7,0,0
630 IF JK=0 THEN PRINT TAB(8);:"Press <P> to play again,":GOTO 650
640 PRINT TAB(4);:"Press fire button to play again."
650 PRINT TAB(9);:"or press <Q> to quit."
660 IF JK=1 AND STRIG(1) THEN 160
670 Z$=INKEY$:IF Z$="" THEN 660
680 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123))
690 IF Z$<>"Q" AND Z$ <>"P" THEN 660
700 IF Z$="P" THEN 160
1000 CLS:COLOR 7,0,0:END
1010 X1=X1+1:IF X1>30 THEN X1=7:Y1=INT(RND(1)*13)+6
1020 IF X2>7 AND Y2>5 THEN X2=X2-1:Y2=Y2-1:GOTO 1040
1030 X2=INT(RND(1)*24)+7:Y2=19
1040 IF Y3<19 AND X3<30 THEN X3=X3+1:Y3=Y3+1:GOTO 1060
1050 X3=INT(RND(1)*24)+7:Y3=5
1060 Y4=Y4-1:IF Y4<5 THEN Y4=19:X4=INT(RND(1)*23)+7
1070 LOCATE B1,A1:PRINT SP$;
1080 LOCATE Y1,X1,0:COLOR 2,0,0:PRINT SK$;
1090 LOCATE B2,A2,0:PRINT SP$;
1100 LOCATE Y2,X2,0:COLOR 13,0,0:PRINT SK$;
1110 LOCATE B3,A3,0:PRINT SP$;
1120 LOCATE Y3,X3,0:COLOR 12,0,0:PRINT SK$;
1130 LOCATE B4,A4,0:PRINT SP$;
1140 LOCATE Y4,X4,0:COLOR 7,0,0:PRINT SK$;
1150 A1=X1:B1=Y1:A2=X2:B2=Y2:A3=X3:B3=Y3:A4=X4:B4=Y4
1160 IF SCREEN(G2,G1)=24 THEN 1180
1170 LOCATE G2,G1:COLOR 14,0,0:PRINT XX$;
1180 FL=-(SCREEN(R0,CO)>42):RETURN
2000 SOUND 1700,1:RETURN

```

Tandy Color Computer w/Extended BASIC/Criss-cross

```

20 UPS="I":WN$="M":LE$="J":RI$="K"
30 UP=ASC(UP$):WN=ASC(WN$):LE=ASC(LE$):RI=ASC(RI$)
40 SB=1024:PL$=CHR$(42):SS=CHR$(32):SP$=S$+$S+$S

```

```

50 SQ$=CHR$(143+48):SK$="<"+CHR$(128)+">"
60 TB$=STRING$(30,SQ$):XX$=CHR$(88)
70 CLS:PRINT
80 PRINT "DO YOU WANT TO USE THE"
90 PRINT "<K>EYBOARD OR A <J>OYSTICK?"
100 JK$=INKEY$:IF JK$<>"J" AND JK$<>"K" THEN 100
110 IF JK$="J" THEN JK=1 ELSE JK=0
120 X1=RND(4)+7:Y1=RND(3)+6:X2=RND(6)+2:Y2=RND(6)+6
130 X3=RND(4)+7:Y3=RND(3)+6
140 CO=RND(1)*8+10:RO=RND(6)+3
150 A1=X1:A2=X2:A3=X3:B1=Y1:B2=Y2:B3=Y3
160 H1=C0:H2=R0:S=10:SC=0:FL=0:PS=HS
170 CLS:PRINT TAB(4);"-THE CRISSCROSS GAME-"
180 PRINT@449,"";
190 IF JK=1 THEN PRINT "USE A JOYSTICK TO MOVE PLAYER.
":GOTO 220
200 PRINT "<";UP$;">UP <";WN$;">DOWN";
210 PRINT "<";LE$;">LEFT <";RI$;">RIGHT"
220 PRINT "REACH SPOT MARKED X FOR POINTS.";
230 PRINT@X+29,SQ$;:NEXT X
240 FOR X=97 TO 417 STEP 32:PRINT@X,SQ$;
250 PRINT@X+29,SQ$;:NEXT X
260 PRINT@C0+32*R0,PL$;
270 PRINT@34,"HIGH SCORE:";HS;" SCORE:";SC;
280 G1=RND(24)+2:G2=RND(10)+2
290 GOSUB 1000:IF FL THEN 450
300 IF JK=1 THEN 340
310 K$=INKEY$:IF K$="" THEN 290
320 K=ASC(K$):CO=C0-(K=RI)+(K=LE)
330 RO=RO-(K=WN)+(K=UP):GOTO 380
340 KX=JOYSTK(0):KY=JOYSTK(1)
350 IF KX<20 OR KX>43 THEN 370
360 IF KY>20 AND KY<43 THEN 290
370 CO=CO+(KX<20)-(KX>43):RO=RO+(KY<20)-(KY>43)
380 PRINT@H1+32*H2,S$;
390 SR=PEEK(SB+C0+32*RO):IF SR>123 THEN 450
400 PRINT@C0+32*R0,PL$;
410 H1=C0:H2=R0
420 IF CO<>G1 OR RO<>G2 THEN 290
430 SC=SC+S:S=S+10:X=5:IF SC>HS THEN HS=SC
440 GOSUB 2000:GOTO 270
450 FOR X=1 TO 10
460 PRINT@C0+32*R0,CHR$(RND(3)+42);
470 GOSUB 2000:NEXT X
480 CLS:PRINT@164,"SORRY, YOU WERE ZAPPED!"
490 IF SC<=PS THEN 530
500 PRINT
510 PRINT " YEAH! YOU WIN THE OTOY AWARD"
520 PRINT " FOR BREAKING THE HIGH SCORE!":HS=SC
530 PRINT
540 IF JK=1 THEN PRINT "PRESS FIRE BUTTON TO PLAY AGAIN
N,":GOTO 560
550 PRINT TAB(4);:"PRESS <P> TO PLAY AGAIN,"
560 PRINT TAB(5);:"OR PRESS <Q> TO QUIT."
570 IF PEEK(65280)=254 OR PEEK(65280)=253 THEN 120
580 K$=INKEY$:IF K$<>"Q" AND K$<>"P" THEN 570
590 IF K$="P" THEN 120
600 CLS:END
1000 X1=X1+1:IF X1>27 THEN X1=2:Y1=RND(9)+3
1010 IF X2>2 AND Y2>3 THEN X2=X2-1:Y2=Y2-1:GOTO 1030
1020 X2=RND(25)+2:Y2=12
1030 IF Y3<12 AND X3<26 THEN X3=X3+1:Y3=Y3+1:GOTO 1050
1040 X3=RND(25)+2:Y3=3
1050 PRINT@A1+32*B1,SP$;:PRINT@X1+32*Y1,SK$;
1060 PRINT@A2+32*B2,SP$;:PRINT@X2+32*Y2,SK$;
1070 PRINT@A3+32*B3,SP$;:PRINT@X3+32*Y3,SK$;
1080 A1=X1:B1=Y1:A2=X2:B2=Y2:A3=X3:B3=Y3
1090 IF PEEK(SB+G1+32*G2)=24 THEN 1110
1100 PRINT@G1+32*G2,XX$;
1110 SR=PEEK(SB+C0+32*RO):FL=-(SR>106):RETURN
2000 SOUND X,1:RETURN

```

CROSSWORD PUZZLER

BY STEVE C.M. CHEN AND KAREN KANE

This is the second in a series of crossword puzzles. Last month we presented a Fourth of July puzzle program with versions for the Commodore 64/128, IBM PC and compatibles, and Tandy Color Computer. The solution appears in this issue. This month's Crossword Puzzler has a computer theme and is translated for Adam, Apple, Atari, and Macintosh computers. Or you can type the data for this month's puzzle (see Computer Puzzle Data below) into last month's program if you have a Commodore, PC compatible, or CoCo. The solution to this puzzle will appear in next month's issue along with data for a back-to-school puzzle. Copies of the July issue are available for \$3.95 from Crossword Puzzler, c/o FAMILY COMPUTING Back Issues, 730 Broadway, New York, NY 10003. Please specify the brand and model of your computer when ordering.

If you're tired of newspaper crossword puzzles that are smudged and ripped from repeated erasures, if you become cross-eyed from deciphering the layers of inked-in letters

when you try to solve a puzzle in pen, or if you're just a fan of challenging puzzles, then *Crossword Puzzler* is the program for you! Type in and run the program, then type in a few short lines of data we supply, and you'll be able to solve (or print out) that month's FAMILY COMPUTING crossword puzzle. Or, you can create your own crossword puzzle for a friend to solve. And, of course, you can duplicate a puzzle that you see in a book or newspaper and solve it on your computer screen instead!

To use our crossword puzzle program, just type in the version for your computer and SAVE it. When you run the program, a main menu will offer you five choices: 1) Create your own crossword puzzle, 2) Work on an existing puzzle, 3) Create a puzzle using FC data, 4) Solve a puzzle, or 5) Quit.

1) CREATE YOUR OWN PUZZLE

When you choose option 1 from the main menu, a 15-by-15 grid of dots appears on the screen. This grid is where you enter the letters and solid blocks

that make up any crossword design.

Along with the grid is a command menu describing the operations available when creating your own puzzle. To enter a letter just type it. Enter a solid block by pressing CTRL-B (see special instructions for Macintosh below). Or, if you just want to move around the grid, use the cursor keys. (Apple II users can move up by simultaneously pressing the CTRL-K keys and move down by pressing the CTRL-J keys.) The grid is set up for a 15-by-15 square puzzle but, if you want a smaller puzzle, you can make a new border by filling in the extra squares with solid blocks. To "erase" an entry, type over it with a new letter or a block, or type a period (".") to leave the square blank. At any time, you can print the current puzzle with the CTRL-P command, SAVE it and return to the main menu with CTRL-S or press CTRL-E to exit to the main menu without saving. If you choose this option, though, you'll lose all your work!

2) WORK ON AN EXISTING PUZZLE

This feature allows you to load a previously SAVED puzzle that you have started to design and want to change. When the puzzle appears on the screen, you can use all the same commands that are available when creating a puzzle. Make sure to SAVE your new version under a different name, unless you want to SAVE over the old one.

3) CREATE A PUZZLE USING FC DATA

When you choose to create one of FAMILY COMPUTING's puzzles (option 3 on the main menu), a table will appear where you input the data for one of our original puzzles. This month the puzzle has a computer theme, and the data listed below establish the pattern of blank spaces and solid blocks that relates to the crossword clues. When you have correctly typed in a line of data, you can press RETURN or ENTER and input the next line. Once all of the data is correctly entered, you must SAVE it. You can exit the data input feature without saving by typing CTRL-E, but no warning will be given.

4) SOLVE A PUZZLE

To solve a puzzle, choose option 4 from the main menu and type in the name of the saved puzzle that you wish to work on. You can load either a FAMILY COMPUTING puzzle or one that you or a friend has designed. In either case, the unsolved or partially solved puzzle pattern will appear ready for input. You can move around the puzzle in the same manner as you do when creating a puzzle, but the option to add or erase blocks is not available.

5) QUIT

Choose this option to exit from the program. You will be asked if you're sure you want to QUIT so that if you haven't SAVED or PRINTED your most recent work, you have a chance to go back and do so.

HINTS ON SAVING

When SAVING your puzzles, it's a good idea to give them names to distinguish between puzzles that are being created and ones that are being solved.

For example, if you are creating a puzzle with beach words, you may SAVE the first version as MYBEACH.1 and a final version as MYBEACH.SOL. This final version can then be used in two ways by *Crossword Puzzler*. If it is LOAD-

SOLUTION TO LAST MONTH'S PUZZLE

L	I	F	E	T	R	A	P		H	Y				
Y	A	R	N		H	A	R	I	A	R	A	B		
N	E	C		I	S	A	T		N	E	W	E		
G	E	O	G	R	A	P	H	I	C	A	L	L		
R	A	T				N	O		L	E				
I	N	D	E	P	E	N	D	E						
D	A	R	S	E	E		K	E	T	C	H			
O	M	A	R	N		A	R	T	L	A	O			
L	E	G	A	L		T	E	E		P	O	D		
B	J				B	I	R	T	H	D	A	Y	C	A
R	E	P	R	E	S	P	E	R						
A	L	L	E	R		E	A	R		E	M	I	T	
S	L	E	P	T		T	A	R		R	I	N	A	
S	O	A	P	Y		T	O	Y		S	T	A	R	

Nobody's Perfect...

Game	Winner	Time to Move
1	SARGON III	5 seconds
2	SARGON III	5 seconds
3	SARGON III	15 seconds
4	SARGON III	15 seconds
5	SARGON III	30 seconds
6	Chessmaster	30 seconds
7	SARGON III	3 min
8	SARGON III	3 min

YOU CAN'T WIN THEM ALL.

We pitted Sargon III, the world champion, against the challenger. Head to head, with no punches pulled. And believe it or not, the champ lost one game to the challenger. But Sargon III beats Chessmaster 2000 almost everytime.

Sargon III is the result of more than twenty one man years of development. Sargon III will play at precisely the level of difficulty you desire. Ask Sargon III for a hint, take back a move you've already made, replay a sequence, change sides, or set up your own board for customized learning. Sargon III lets you study in detail more than 100 great games of history or review 45 classic chess problems,

all on screen. Sargon III also includes the largest library of opening moves available on any chess program.

SARGON III WRITES CHESS

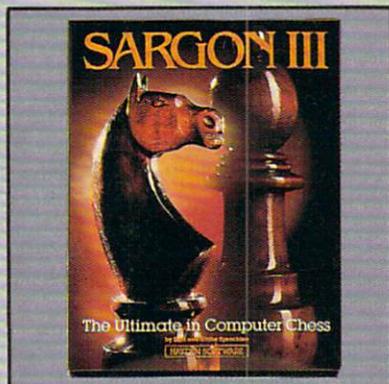
HISTORY

In a tournament sanctioned by the U.S. Chess Federation, Sargon III beat

a master rated 2209. That makes Sargon III the only microcomputer program ever to defeat a player at that level.

Sargon III has no trouble wiping Chessmaster 2000 off the globe. Someday, maybe a chess playing program will be able to beat Sargon III. Until then, which chess program do you want to own: the world champion or the runner-up?

(Note: The test was run on two Apple II computers. Each program played once as white and once as black at each level. Send us \$5.00 for handling, along with a postage paid return envelope and we'll send you a copy of the moves each side played.)



Sargon III is available for: Apple II series, Apple Macintosh, IBM PC and Commodore 64/128 computers. You can find Sargon III at your local retailer or call 1-800-826-0706. Illinois residents call 1-800-826-1330. Only MasterCard, VISA and American Express accepted for phone orders.

HAYDEN
SOFTWARE

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CIRCLE READER SERVICE 31

PUZZLE

ed from menu option 4 (Solve a Puzzle), only the pattern of blocks will show up on screen so the puzzle is ready for someone to solve. While solving a puzzle, it's very important to SAVE partially solved puzzles with a name different from the solution such as MYBEACH.TRY. If MY-BEACH.SOL is loaded from menu option 2 (Work on an Existing Puzzle), the completed puzzle shows up.

SPECIAL INSTRUCTIONS FOR MACINTOSH PUZZLERS

On the Macintosh, there is no CTRL key. To perform a control function you simply use the OPTION key along with the key that corresponds to the operation you want. For example, to insert a solid block into the puzzle you would type OPTION-B.

Also, the Macintosh does not have cursor keys. To move around the grid, use OPTION-K to move up, OPTION-M to move left, OPTION-, to move down, and OPTION-. to move right.

Computer-Puzzle Data

A FAKA,EBJB,FCMC,DDGD,1106
 B NDOD,BECE,EEHE,IEJE,1128
 C KELE,HFIF,AGDG,JGDH,1134
 D IHKH,EIFI,KIOI,BJEJ,1160
 E FJGJ,KJLJ,CKDK,JKLK,1173
 F NKDL,HLML,AMDM,IMDN,1181
 G HNNN,ONEO,FOGO,HOIO,1213
 H JOZZ,ZZZZ,ZZZZ,ZZZZ,6413

Computer-Puzzle Clues

Across

- 1A Spread _____
 1G CLS in Applesoft BASIC
 1L Type style
 2A Word with communicate or vision
 2F Bar used to raise pitch of stringed instruments
 2K Made of flax
 3A Banish
 3G Unexpected
 3N Spielberg character
 4A Anatomical vessel
 4E Egyptian sun-god
 4H Disk division
 5F Mr. Lewis of sci-fi
 5M Recede; abate
 6A Computer hotbed; two words with 6J across
 6J See 6A across
 7B Prefix for host or exist
 7E What an Epson FX-80 can do
 7K Smallest amount
 8A Portion of land
 8E Command to reverse last action
 8L Feminine suffix
 9A _____date; overwhelm
 9G Wicked
 9L Grande or de Janeiro
 10C Compass direction
 10H Superlative suffix
 10M Possess
 11A Symbol for technetium
 11E Electronic drawing pad or Australian marsupial
 12A Sneaky
 12E Computer corp.

12I Clan

- 12N Opposite of out
 13B Letters in a ligature
 13E System of symbols
 13J Equality
 14A Andy's sidekick
 14E Word with skeleton or skate
 14I Fundamental; computer language
 15A Trial
 15K Rodent

Down

- 1A Wozniak and Jobs
 1B _____decimal
 1C Ivy League bulldogs
 1D Moray
 1G Owns
 1H Musical composition
 1I A la _____
 1L End, to Guido
 1M Not off
 1N Born, in Nice
 1O Explosive
 2K Common BASIC keyword, often omitted
 3E Pause in speech
 3J City belonging to no state, abbr.
 4F Oak nut
 4M Kin
 5D Fa sharp
 5G Slyly disparaging
 5N Give
 5O Eight bits
 6B Symbol
 6C Type of water lily
 6E Heart of a computer

6K Alabama, abbr.

6L Lascivious look

7H New

8A Prints a program

8J Key below SHIFT on IBM PC

9D St. with Lincoln as capital

9I One thing _____good as another (two words)

100 The Big Apple

11B Copy

11E Gun's recoil

11F Woodwind instrument

11G Airmail delivery, abbr.

11K Muscle contraction

12C Years

12J Gov't. agency

12L Threesome

12N Pronoun

13M Place for patients in critical condition

14A IBM PC model with "Advanced Technology"

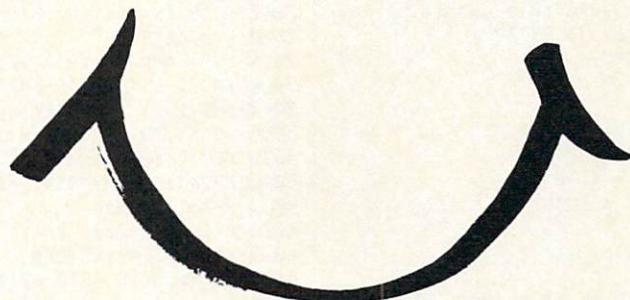
Adam/Crossword Puzzler

```

10 DIM bd$(15,15),dm$(2),n$(15):d$ = CHR$(4)
20 g$ = CHR$(7):p$ = CHR$(46):q$ = CHR$(34)
30 sp$ = CHR$(32):dm$(1) = "-- ACROSS"+sp$
40 dm$(2) = "-- DOWN"+sp$+sp$+sp$
50 cl$ = sp$:FOR a = 2 TO 31:cl$ = cl$+sp$:NEXT a
60 pf$ = "#":FOR a = 2 TO 33:pf$ = pf$+"#":NEXT a
70 ul$ = CHR$(95):ul$ = ul$+ul$+ul$+ul$
80 FOR a = 1 TO 15:n$(a) = STR$(a)+sp$:NEXT a
90 HOME:PRINT TAB(7);"CROSSWORD PUZZLER":PRINT
100 PRINT "<1> Create your own crossword"
110 PRINT TAB(5);"puzzle"
120 PRINT "<2> Work on an existing puzzle"
130 PRINT "<3> Create a puzzle using FC"
140 PRINT TAB(5);"data"
150 PRINT "<4> Solve a puzzle":PRINT "<5> Quit"
160 PRINT:PRINT TAB(10);Selection: ";
170 GET k$:ms = VAL(k$)
180 IF ms < 1 OR ms > 5 THEN PRINT g$,:GOTO 170
190 HOME:ON ms GOTO 200,200,1050,220,1450
200 c$ = "BAEDLS":w = 0:IF ms = 2 THEN 230
210 GOSUB 3000:GOTO 440
220 c$ = "EASDL":w = 1
230 HOME:INPUT "What is the name of this puzzle? ";f$ 
240 IF f$ = "" THEN 90
250 ONERR GOTO 420
260 HOME:PRINT d$;"open ";f$ 
270 PRINT d$;"read ";f$ :INPUT t
280 IF w = 0 AND t = 1 THEN 360
290 FOR y = 1 TO 15:FOR x = 1 TO 15
300 INPUT bd$(x,y):NEXT x,y:HOME
310 PRINT d$;"close ";f$ :CLERR
320 IF w = 0 OR t = 1 THEN 440
330 FOR x = 1 TO 15:FOR y = 1 TO 15
340 IF bd$(x,y) <> sp$ THEN bd$(x,y) = p$ 
350 NEXT y,x:GOTO 440
360 HOME:PRINT d$;"close ";f$ 
370 CLERR:HOME
380 PRINT g$;g$;"Sorry! This file is not"
390 PRINT "loadable from menu choice 2."
400 PRINT "Select <4> Solve a puzzle to"
410 PRINT "load it.":GOSUB 3500:GOTO 230
420 HOME:PRINT d$;"close ";f$ :CLERR
430 GOSUB 4000:GOTO 230
440 HOME:tm = 2:lm = 7:wd = 17:ht = 15:GOSUB 2000
450 VTAB 1:HTAB 8
460 FOR a = 1 TO 15:PRINT CHR$(64+a)::NEXT a
470 FOR y = 1 TO 15:VTAB 2+y:HTAB 4:PRINT n$(y);
480 VTAB 2+y:HTAB 8:FOR x = 1 TO 15:t$ = bd$(x,y)
490 IF t$ <> sp$ THEN PRINT t$,:GOTO 510
500 INVERSE:PRINT t$::NORMAL
510 NEXT x:VTAB y+2:HTAB 25:PRINT n$(y)
520 NEXT y:sk = 2
530 VTAB 20:IF ms = 4 THEN 570
540 PRINT "<CTRL+A>=Across <CTRL+B>=Block"
550 PRINT "<CTRL+D>=Down <CTRL+E>=Exit"
560 cx = 1:cy = 1:GOTO 620
570 cx = 0:cy = 0:FOR y = 1 TO 15:FOR x = 1 TO 15
580 IF bd$(x,y) = p$ THEN cx = x:cy = y:x = 15:y = 15
590 NEXT x,y
600 PRINT "<CTRL+A>=Across <CTRL+D>=Down" →

```

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PUZZLE

```

610 PRINT "<CRTL+E>=Exit"
620 PRINT "<CRTL+L>=Print current puzzle"
630 PRINT "<CRTL+S>=Save & return to menu"
640 IF cx <> 0 THEN 670
650 bd$(1,1) = p$:cx = 1:cy = 1
660 VTAB 3:HTAB 8:PRINT p$;
670 VTAB 19:HTAB 9:PRINT CHR$(64+cx);n$(cy);dm$(sk/2)
680 VTAB cy+2:HTAB cx+7
690 GET k$:k = ASC(k$)
700 dk = (k = 163)+2*(k = 161)+3*(k = 160)+4*(k = 162)
710 IF dk <> 0 THEN GOSUB 4500:GOTO 670
720 IF k$ > CHR$(31) THEN 1010
730 ck = 0:t$ = CHR$(ASC(k$)+64):FOR a = 1 TO LEN(c$)
740 IF MID$(c$,a,1) = t$ THEN ck = a:a = LEN(c$)
750 NEXT a:IF ck = 0 THEN PRINT g$;:GOTO 690
760 IF w = 0 THEN ON ck GOTO 780,800,810,800,860,1000
770 ON ck GOTO 810,800,1000,800,860
780 bd$(cx,cy) = sp$:VTAB cy+2:HTAB cx+7
790 INVERSE:PRINT sp$;:NORMAL:GOTO 1040
800 sk = ck:GOTO 670
810 nl = 5:GOSUB 5000:VTAB 19
820 PRINT g$;g$;"You have not saved this puzzle."
830 PRINT "ARE YOU SURE YOU WANT TO EXIT?";
840 GOSUB 5500:nl = 2:GOSUB 5000
850 ON k$ = "Y" GOTO 90:GOTO 530
860 nl = 5:GOSUB 5000:VTAB 19
870 PRINT "Press any key when printer is"
880 PRINT "ready.":GET k$:HOME
890 PR# 1:PRINT SPC(5);:FOR a = 1 TO 15
900 PRINT CHR$(64+a);sp$;:NEXT a:PRINT
910 PRINT SPC(3);pfs
920 FOR y = 1 TO 15:PRINT n$(y);
930 IF y < 10 THEN PRINT sp$;
940 PRINT "#";sp$;:FOR x = 1 TO 15:t$ = bd$(x,y)
950 IF t$ <> sp$ THEN PRINT t$;sp$;:GOTO 970
960 PRINT "*";sp$;
970 NEXT x:PRINT "#";sp$;n$(y):NEXT y
980 PRINT SPC(3);pfs
990 PRINT:PR# 0:GOTO 440
1000 GOSUB 6000:ON f$ = "" GOTO 440:GOTO 90
1010 GOSUB 2500:IF (k$ < "A" OR k$ > "Z") AND k$ <> p$ THEN PRINT g$;:GOTO 680
1020 bd$(cx,cy) = k$
1030 VTAB cy+2:HTAB cx+7:PRINT k$;
1040 dk = sk:GOSUB 4500:GOTO 670
1050 VTAB 1:HTAB 8:PRINT "INPUT FC DATA":GOSUB 3000
1060 zy = 1:h$ = ul$:t$ = ul$:FOR a = 1 TO 4
1070 h$ = h$+",":ul$:t$ = t$+ul$:NEXT a:cd$ = ""
1080 VTAB zy+1:HTAB 1:PRINT CHR$(64+zy);sp$;h$;
1090 a$ = t$:zx = 0
1100 VTAB 19:PRINT "Press <RETURN> to move to next"
1110 PRINT "Line or <CRTL+E> to exit"
1120 PRINT "without saving."
1130 VTAB zy+1:HTAB zx+3+INT(zx/4)
1140 GET k$:dx = (k$ = CHR$(161))-(k$ = CHR$(163))
1150 ON (dx = 0) GOTO 1170:zx = zx+dx
1160 zx = zx+((zx = -1)-(zx = 20))*20:GOTO 1130
1170 IF k$ = CHR$(5) THEN PRINT g$;g$;:GOTO 90
1180 IF k$ <> CHR$(13) THEN 1400
1190 nl = 3:GOSUB 5000:cv = VAL(RIGHT$(a$,4))
1200 ct = 0:FOR a = 1 TO 16:ct = ct+ASC(MID$(a$,a,1))
1210 NEXT a:IF ct = cv-(cv > 5000)*5000 THEN 1250
1220 VTAB 19:FLASH
1230 PRINT g$;g$;"You have made a typo in Line ";CHR$(64+zy);".":NORMAL
1240 GOSUB 3500:nl = 4:GOSUB 5000:zx = 0:GOTO 1100
1250 IF cv > 5000 THEN 1280
1260 cd$ = cd$+LEFT$(a$,16):zy = zy+1
1270 ON zy < 16 GOTO 1080:GOTO 1310
1280 t = 16:FOR a = 1 TO 15 STEP 2
1290 IF MID$(a$,a,1) = "Z" THEN t = a-1:a = 15
1300 NEXT a:cd$ = cd$+LEFT$(a$,t)
1310 FOR a = 1 TO LEN(cd$)-1 STEP 2
1320 x$ = MID$(cd$,a,1):y$ = MID$(cd$,a+1,1)

```

```

1330 bd$(ASC(x$)-64,ASC(y$)-64) = sp$:NEXT a
1340 GOSUB 6000:IF f$ = "" THEN PRINT g$;g$;:GOTO 1340
1350 HOME:PRINT "Press <M> for menu or <S> to"
1360 PRINT "solve the puzzle."
1370 GET k$:GOSUB 2500:IF k$ <> "M" AND k$ <> "S" THEN
PRINT g$;:GOTO 1370
1380 IF k$ = "M" THEN 90
1390 ms = 4:w = 1:c$ = "EASDP":GOTO 440
1400 GOSUB 2500:IF (k$ < "A" OR k$ > "Z") AND (k$ < "0"
" OR k$ > "9") THEN PRINT g$;:GOTO 1130
1410 VTAB zy+1:HTAB zx+3+INT(zx/4):PRINT k$;
1420 IF zx = 0 THEN a$ = k$+MID$(a$,2):GOTO 1440
1430 a$ = LEFT$(a$,zx)+k$+MID$(a$,zx+2)
1440 zx = zx+1-(zx = 19):GOTO 1130
1450 PRINT g$;"Are you sure you want to quit? ";
1460 GOSUB 5500:IF k$ = "N" THEN 90
1470 HOME:END
2000 INVERSE:VTAB tm:HTAB lm
2010 PRINT SPC(wd):FOR y = 1 TO ht
2020 VTAB tm+y:HTAB lm:PRINT sp$;
2030 VTAB tm+y:HTAB lm+wd-1:PRINT sp$:NEXT y
2040 VTAB tm+ht+1:HTAB lm:PRINT SPC(wd):NORMAL:RETURN
2500 k = ASC(k$)
2510 k$ = CHR$(k-(k > 96)*(k < 123)*32):RETURN
3000 FOR x = 1 TO 15:FOR y = 1 TO 15
3010 bd$(x,y) = p$:NEXT y,x:RETURN
3500 PRINT:PRINT "Press any key to continue.";
3510 GET k$:RETURN
4000 PRINT:FLASH:PRINT g$;g$;"DISK I/O ERROR."
4010 PRINT:NORMAL
4020 PRINT "Please check disk & disk drive."
4030 GOSUB 3500:RETURN
4500 ON dk GOTO 4510,4510,4530,4530
4510 cx = cx-(dk = 1)+(dk = 2)
4520 cx = cx+((cx = 0)-(cx = 16))*15:GOTO 4550
4530 cy = cy-(dk = 3)+(dk = 4)
4540 cy = cy+((cy = 0)-(cy = 16))*15
4550 IF bd$(cx,cy) = sp$ AND w = 1 THEN 4500
4560 RETURN
5000 VTAB 19:HTAB 1:FOR a = 1 TO nl:PRINT cl$;
5010 NEXT a:RETURN
5500 GET k$:GOSUB 2500:IF k$ <> "Y" AND k$ <> "N" THEN
PRINT g$;:GOTO 5500
5510 RETURN
6000 HOME:INPUT "Save under what name? ";f$;
6010 IF f$ = "" THEN RETURN
6020 ONERR GOTO 6090
6030 PRINT d$;"open ";f$;PRINT d$;"write ";f$;PRINT w
6040 FOR y = 1 TO 15:FOR x = 1 TO 15
6050 PRINT q$;bd$(x,y);q$;
6060 NEXT x,y:HOME
6070 PRINT d$;"close ";f$;
6080 CLRERR:RETURN
6090 HOME:PRINT d$;"close ";f$;CLRERR
6100 GOSUB 4000:f$ = "":RETURN

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Apple II series w/disk drive (printer optional)/ Crossword Puzzler

```

10 DIM BD$(15,15),DM$(2),MUS$(5),NS(15):D$ = CHR$(4)
20 GS = CHR$(7):P$ = CHR$(46):Q$ = CHR$(34)
30 SP$ = CHR$(32):DM$(1) = "-- ACROSS"+SP$
40 DM$(2) = "-- DOWN"+SP$+SP$+SP$
50 CL$ = SP$:FOR L = 2 TO 37:CL$ = CL$+SP$:NEXT L
60 PFS = "#":FOR L = 2 TO 33:PFS = PFS+"#":NEXT L
70 ULS = CHR$(95):ULS = ULS+ULS+ULS+ULS
80 FOR L = 1 TO 15:NL = STR$(L)+SP$:NEXT L
90 FOR L = 1 TO 5:READ MUS(L):NEXT L
100 HOME:LM = 1:TM = 1:WD = 40:HT = 9:GOSUB 2000
110 VTAB 1:HTAB 12:PRINT " CROSSWORD PUZZLER "
120 FOR L = 1 TO 5:VTAB 2+L:HTAB 3:PRINT MUS(L):NEXT L
130 VTAB 9:HTAB 15:PRINT "SELECTION: ";
140 GET KS:MS = VAL(K$)
150 IF MS < 1 OR MS > 5 THEN PRINT G$;:GOTO 140

```

```

160 HOME:ON MS GOTO 170,170,980,190,1380
170 C$ = "BAEDPS":W = 0:IF MS = 2 THEN 200
180 GOSUB 3000:GOTO 380
190 C$ = "EASDP":W = 1
200 HOME:INPUT "WHAT IS THE NAME OF THIS PUZZLE? ";FS
210 IF FS = "" THEN 100
220 ONERR GOTO 360
230 PRINT DS;"OPEN ";FS:PRINT DS;"READ ";FS:INPUT T
240 IF W = 0 AND T = 1 THEN 310
250 FOR X = 1 TO 15:FOR Y = 1 TO 15:INPUT BD$(X,Y)
260 NEXT X,Y:PRINT DS;"CLOSE ";FS:POKE 216,0
270 IF W = 0 OR T = 1 THEN 380
280 FOR X = 1 TO 15:FOR Y = 1 TO 15
290 IF BD$(X,Y) <> SP$ THEN BD$(X,Y) = PS
300 NEXT Y,X:GOTO 380
310 PRINT DS;"CLOSE ";FS:POKE 216,0:HOME
320 PRINT G$;G$;"SORRY! THIS FILE IS NOT LOADABLE"
330 PRINT "FROM MENU CHOICE 2."
340 PRINT "SELECT <4> SOLVE A PUZZLE TO LOAD IT."
350 GOSUB 3500:GOTO 200
360 PRINT DS;"CLOSE ";FS
370 POKE 216,0:GOSUB 4000:GOTO 200
380 HOME:TM = 2:LM = 12:WD = 17:HT = 15:GOSUB 2000
390 VTAB 1:HTAB 13
400 FOR L = 1 TO 15:PRINT CHR$(64+L);:NEXT L
410 FOR Y = 1 TO 15:VTAB 2+Y:HTAB 9:PRINT NS(Y)
420 VTAB 2+Y:HTAB 13:FOR X = 1 TO 15:T$ = BD$(X,Y)
430 IF T$ <> SP$ THEN PRINT T$;:GOTO 450
440 INVERSE:PRINT SP$;:NORMAL
450 NEXT X:VTAB Y+2:HTAB 30:PRINT NS(Y)
460 NEXT Y:SK = 2
470 VTAB 20:IF MS = 4 THEN 510
480 PRINT TAB(3);"<CRTL>+<A>=ACROSS <CRTL>+<B>=BLOCK"
490 PRINT TAB(3);"<CRTL>+<D>=DOWN <CRTL>+<E>=EXIT"
500 CX = 1:CY = 1:GOTO 560
510 CX = 0:CY = 0:FOR Y = 1 TO 15:FOR X = 1 TO 15
520 IF BD$(X,Y) = PS THEN CX = X:CY = Y:X = 15:Y = 15
530 NEXT X,Y
540 PRINT TAB(3);"<CRTL>+<A>=ACROSS <CRTL>+<D>=DOWN"
550 PRINT TAB(3);"<CRTL>+<E>=EXIT"
560 PRINT TAB(3);"<CRTL>+<P>=PRINT CURRENT PUZZLE"
570 PRINT TAB(3);"<CRTL>+<S>=SAVE & RETURN TO MENU"
580 IF CX <> 0 THEN 610
590 BD$(1,1) = PS:CX = 1:CY = 1
600 VTAB 3:HTAB 13:PRINT PS
610 VTAB 19:HTAB 14
620 PRINT CHR$(64+CX);NS(CY);DM$(SK/2)
630 VTAB CY+2:HTAB CX+12
640 GET K$:K = ASC(K$)
650 DK = (K = 8)+2*(K = 21)+3*(K = 11)+4*(K = 10)
660 IF DK <> 0 THEN GOSUB 4500:GOTO 610
670 IF K$ > CHR$(31) THEN 940
680 CK = 0:T$ = CHR$(ASC(K$)+64):FOR L = 1 TO LEN(C$)
690 IF MID$(C$,L,1) = T$ THEN CK = L:L = LEN(C$)
700 NEXT L:IF CK = 0 THEN PRINT G$;:GOTO 640
710 IF W = 0 THEN ON CK GOTO 730,750,760,750,810,930
720 ON CK GOTO 760,750,930,750,810
730 BD$(CX,CY) = SP$:VTAB CY+2:HTAB CX+12
740 INVERSE:PRINT SP$;:NORMAL:GOTO 970
750 SK = CK:GOTO 610
760 NL = 5:GOSUB 5000:VTAB 19
770 PRINT G$;G$;"YOU HAVE NOT SAVED THIS PUZZLE."
780 PRINT "ARE YOU SURE YOU WANT TO EXIT? ";
790 GOSUB 5500:NL = 2:GOSUB 5000
800 ON K$ = "Y" GOTO 100:GOTO 470
810 NL = 5:GOSUB 5000:VTAB 19
820 PRINT "PRESS ANY KEY WHEN PRINTER IS READY."
830 GET K$:NL = 1:GOSUB 5000
840 PRINT DS;"PR#1":PRINT SPC(5)::FOR L = 1 TO 15
850 PRINT CHR$(64+L);SP$;:NEXT L:PRINT
860 PRINT SPC(3);PF$:FOR Y = 1 TO 15:PRINT NS(Y);
870 IF Y < 10 THEN PRINT SP$;
880 PRINT "#";SP$;:FOR X = 1 TO 15:T$ = BD$(X,Y)
890 IF T$ <> SP$ THEN PRINT T$;SP$;:GOTO 910

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```

900 PRINT "*";SP$;
910 NEXT X:PRINT "#";SP$;NS(Y):NEXT Y
920 PRINT SPC(3);PF$:PRINT DS;"PR#0":GOTO 380
930 GOSUB 6000:ON FS = "" GOTO 380:GOTO 100
940 GOSUB 2500:IF (K$ < "A" OR K$ > "Z") AND K$ <> P$ THEN PRINT G$;:GOTO 630
950 BD$(CX,CY) = K$
960 VTAB CY+2:HTAB CX+12:PRINT K$
970 DK = SK:GOSUB 4500:GOTO 610
980 LM = 2:TM = 1:WD = 30:HT = 15:GOSUB 2000
990 VTAB 1:HTAB 9:PRINT " INPUT FC DATA ":GOSUB 3000
1000 ZY = 1:H$ = UL$:T$ = UL$:FOR L = 1 TO 4
1010 HS = HS+",":UL$:T$ = T$+UL$:NEXT L:CDS = ""
1020 VTAB ZY+1:HTAB 4:PRINT CHR$(64+ZY);SP$;H$;
1030 LS = T$:ZX = 0:VTAB 19
1040 PRINT "PRESS <RETURN> TO MOVE TO NEXT LINE"
1050 PRINT "OR <CTRL>+<E> TO EXIT WITHOUT SAVING."
1060 VTAB ZY+1:HTAB ZX+6+INT(ZX/4)
1070 GET K$:DX = (K$ = CHR$(21))-(K$ = CHR$(8))
1080 ON (DX = 0) GOTO 1100:ZX = ZX+DX
1090 ZX = ZX+((ZX = -1)-(ZX = 20))*20:GOTO 1060
1100 IF K$ = CHR$(5) THEN PRINT G$;G$;:GOTO 100
1110 IF K$ <> CHR$(13) THEN 1330
1120 NL = 2:GOSUB 5000:CV = VAL(RIGHT$(LS,4))
1130 CT = 0:FOR L = 1 TO 16:CT = CT+ASC(MID$(LS,L,1))
1140 NEXT L:IF CT = CV-(CV > 5000)*5000 THEN 1180
1150 VTAB 19:FLASH
1160 PRINT G$;G$;"YOU HAVE MADE A TYPO IN LINE ";CHR$(64+ZY);".":NORMAL
1170 GOSUB 3500:NL = 3:GOSUB 5000:GOTO 1030
1180 IF CV > 5000 THEN 1210
1190 CDS = CDS+LEFT$(LS,16):ZY = ZY+1
1200 ON ZY < 16 GOTO 1020:GOTO 1240
1210 T = 16:FOR L = 1 TO 15 STEP 2
1220 IF MID$(LS,L,1) = "Z" THEN T = L-1:L = 15
1230 NEXT L:CDS = CDS+LEFT$(LS,T)
1240 FOR L = 1 TO LEN(CDS)-1 STEP 2
1250 X$ = MID$(CDS,L,1):Y$ = MID$(CDS,L+1,1)
1260 BD$(ASC(X$)-64,ASC(Y$)-64) = SP$:NEXT L
1270 GOSUB 6000:IF FS = "" THEN PRINT G$;G$;:GOTO 1270
1280 HOME:PRINT "PRESS <M> FOR MENU OR <S> TO SOLVE"
1290 PRINT "THE PUZZLE."
1300 GET K$:GOSUB 2500:IF K$ <> "M" AND K$ <> "S" THEN PRINT G$;:GOTO 1300
1310 IF K$ = "M" THEN 100
1320 MS = 4:W = 1:C$ = "EASDP":GOTO 380
1330 GOSUB 2500:IF (K$ < "A" OR K$ > "Z") AND (K$ < "0" OR K$ > "9") THEN PRINT G$;:GOTO 1060
1340 VTAB ZY+1:HTAB ZX+6+INT(ZX/4):PRINT K$
1350 IF ZX = 0 THEN LS = K$+MID$(LS,2):GOTO 1370
1360 LS = LEFT$(LS,ZX)+K$+MID$(LS,ZX+2)
1370 ZX = ZX+1-(ZX = 19):GOTO 1060
1380 PRINT G$;"ARE YOU SURE YOU WANT TO QUIT? ";
1390 GOSUB 5500:IF K$ = "N" THEN 100
1400 HOME:END
2000 INVERSE:VTAB TM:HTAB LM:PRINT SPC(WD)
2010 FOR Y = 1 TO HT:VTAB TM+Y:HTAB LM:PRINT SP$;
2020 VTAB TM+Y:HTAB LM+WD-1:PRINT SP$;NEXT Y
2030 VTAB TM+HT+1:HTAB LM:PRINT SPC(WD):NORMAL:RETURN
2500 K$ = ASC(K$)
2510 K$ = CHR$(K-(K > 96)*(K < 123)*32):RETURN
3000 FOR X = 1 TO 15:FOR Y = 1 TO 15
3010 BD$(X,Y) = PS:NEXT Y,X:RETURN
3500 PRINT:PRINT "PRESS ANY KEY TO CONTINUE.";
3510 GET K$:RETURN
4000 PRINT:FLASH:PRINT G$;G$;"DISK I/O ERROR."
4010 PRINT:NORMAL
4020 PRINT "PLEASE CHECK DISK AND DISK DRIVE."
4030 GOSUB 3500:RETURN
4500 ON DK GOTO 4510,4510,4530,4530
4510 CX = CX-(DK = 1)+(DK = 2)
4520 CX = CX+((CX = 0)-(CX = 16))*15:GOTO 4550
4530 CY = CY-(DK = 3)+(DK = 4)
4540 CY = CY+((CY = 0)-(CY = 16))*15

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PUZZLE

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4550 IF BD$(CX,CY) = SP$ AND W = 1 THEN 4500
4560 RETURN
5000 VTAB 19:HTAB 1:FOR L = 1 TO NL:PRINT CL$
5010 NEXT L:RETURN
5500 GET K$:GOSUB 2500:IF K$ <> "Y" AND K$ <> "N" THEN
    PRINT GS$:GOTO 5500
5510 RETURN
6000 HOME:INPUT "SAVE UNDER WHAT NAME? ";FS$
6010 IF FS = "" THEN RETURN
6020 ONERR GOTO 6070
6030 PRINT DS;"OPEN ";FS:PRINT DS;"WRITE ";FS:PRINT W
6040 FOR Y = 1 TO 15:FOR X = 1 TO 15
6050 PRINT QS:BD$(X,Y);QS:NEXT X,Y
6060 PRINT DS;"CLOSE ";FS:POKE 216,0:RETURN
6070 PRINT DS;"CLOSE ";FS
6080 POKE 216,0:GOSUB 4000:FS = "":RETURN
6500 DATA <1> CREATE YOUR OWN CROSSWORD PUZZLE
6510 DATA <2> WORK ON AN EXISTING PUZZLE
6520 DATA <3> CREATE A PUZZLE USING FC DATA
6530 DATA <4> SOLVE A PUZZLE,<5> QUIT

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Atari 800/XL/XE w/disk drive (printer optional)/ Crossword Puzzler

```

10 TRAP 40000:DIM BD$(450),BK$(2),CS(6),CD$(255)
20 DIM CS$(1),CUS(4),DMS(20),FS(15),HS(24),HL$(38)
30 DIM K$(2),LS(20),MS(2),NS(45),PS(1),PT$(33)
40 DIM SS(37),SP$(1),T$(40),UL$(4),Z$(2)
50 POKE 82,0:POKE 752,1
60 BK$=CHR$(160):BK$(2)=CHR$(25):CS$(1)=CHR$(125)
70 PS$=CHR$(46):SP$=CHR$(32)
80 SS$(1)=SP$:SS$(37)=SP$:SS$(2)=SS
90 FOR L=1 TO 4:UL$(L)=CHR$(95):NEXT L
100 DMS$=SS$:DMS$(1)="-- ACROSS":DMS$(11)="-- DOWN"
110 DMS$(18)=SS$:MS$(1,1)=PS$:MS$(2,2)=SP$
120 HL$(1)=CHR$(18):HL$(38)=CHR$(18):HL$(2)=HL$
130 PT$(1)="#"":PT$(33)="#"":PT$(2)=PT$
140 NS$(1)=SP$:NS$(45)=SP$:NS$(2)=NS
150 FOR L=1 TO 15:NS$(L*3-2)=STR$(L):NEXT L:NS$(45)=SP$
160 FOR L=1 TO 4:READ T:CU$(L)=CHR$(T):NEXT L
170 PRINT CS$,SS$(1,9);";CROSSWORD PUZZLER":PRINT
180 PRINT "<1> CREATE YOUR OWN CROSSWORD PUZZLE"
190 PRINT "<2> WORK ON AN EXISTING PUZZLE"
200 PRINT "<3> CREATE A PUZZLE USING FC DATA"
210 PRINT "<4> SOLVE A PUZZLE":PRINT "<5> QUIT"
220 POSITION 12,8:PRINT "SELECTION: ";
230 GOSUB 2500
240 IF K$<"1" OR K$>"5" THEN SL=15:GOSUB 3000:GOTO 230
250 MS=VAL(K$):PRINT CS$;
260 ON MS GOTO 270,270,1100,290,1590
270 C$="BAEDPS":W=0:IF MS=2 THEN BD$="":GOTO 300
280 GOSUB 3500:GOTO 470
290 BD$="":C$="EASDP":W=1
300 PRINT CS$;"WHAT IS THE NAME OF THIS PUZZLE?";
310 POKE 752,0:INPUT TS$:POKE 752,1:IF TS$="" THEN 170
320 FS="D":F$(3)=T$:TRAP 460
330 OPEN #2,4,0,FS:INPUT #2,T
340 IF W=0 AND T=1 THEN 410
350 FOR L=0 TO 14:INPUT #2,TS$:BD$(LEN(BD$)+1)=TS$
360 NEXT L:CLOSE #2:TRAP 40000
370 IF W=0 OR T=1 THEN 470
380 FOR L=1 TO 449 STEP 2
390 IF BD$(L,L+1)<>BK$ THEN BD$(L,L+1)=MS
400 NEXT L:GOTO 470
410 CLOSE #2:TRAP 40000:SL=30:GOSUB 3000:PRINT
420 PRINT "SORRY! THIS FILE IS NOT LOADABLE FROM"
430 PRINT "MENU CHOICE 2.":PRINT "SELECT ";
440 PRINT "<4> SOLVE A PUZZLE TO LOAD IT."
450 GOSUB 4000:GOTO 300
460 CLOSE #1:TRAP 40000:GOSUB 4500:GOTO 300
470 PRINT CS$;:TM=1:LM=3:WD=33:HT=15:GOSUB 2000
480 POSITION 5,0
490 FOR L=1 TO 15:PRINT CHR$(64+L);SP$:NEXT L
500 FOR Y=0 TO 14:C=Y*3+1

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510 POSITION 0,2+Y:PRINT NS$(C,C+1);
520 T=Y*30+1:POSITION 5,2+Y:PRINT BD$(T,T+29);
530 POSITION 37,2+Y:PRINT NS$(C,C+1)
540 NEXT Y:SK=2
550 POSITION 0,19:IF MS=4 THEN 590
560 PRINT SS$(1,3);"<CTRL>+<A>=ACROSS <CTRL>+<B>=BLOCK"
570 PRINT SS$(1,3);"<CTRL>+<D>=DOWN <CTRL>+<E>=EXIT"
580 CX=1:CY=0:FOR Y=1 TO 15:FOR X=1 TO 15
590 T=Y*30+X*2-31
600 T=Y*30+X*2-31
610 IF BD$(T,T+1)=MS THEN CX=X:CY=Y:X=15:Y=15
620 NEXT X:NEXT Y
630 PRINT SS$(1,3);"<CTRL>+<A>=ACROSS <CTRL>+<D>=DOWN"
640 PRINT SS$(1,3);"<CTRL>+<E>=EXIT"
650 PRINT SS$(1,3);"<CTRL>+<P>=PRINT CURRENT PUZZLE"
660 PRINT SS$(1,3);"<CTRL>+<S>=SAVE & RETURN TO MENU"
670 IF CX<>0 THEN 690
680 BD$(1,2)=MS:CX=1:CY=1:POSITION 5,2:PRINT MS
690 T=SK*5-9:POSITION 14,18
700 PRINT CHR$(64+CX);NS$(CY*3-2,CY*3-(CY<10));DMS(T,T+
9)
710 T=CY*30+CX*2-31:T=ASC(BD$(T,T))
720 IF T=160 THEN 740
730 POSITION CX*2+3,CY+1:PRINT CHR$(T+128)
740 GOSUB 2500:POSITION CX*2+3,CY+1:PRINT CHR$(T)
750 DK=0:FOR L=1 TO 4:IF CU$(L,L)=K$ THEN DK=L:L=4
760 NEXT L:IF DK<>0 THEN GOSUB 5000:GOTO 690
770 IF K$>CHR$(31) THEN 1050
780 CK=0:FOR L=1 TO LEN(C$)
790 IF C$(L,L)=CHR$(ASC(K$)+64) THEN CK=L:L=LEN(C$)
800 NEXT L:IF CK=0 THEN GOSUB 3000:GOTO 710
810 IF W=0 THEN ON CK GOTO 830,840,850,840,900,1040
820 ON CK GOTO 850,840,1040,840,900
830 K$=BK$:GOTO 1070
840 SK=CK:GOTO 690
850 NL=5:GOSUB 5500:SL=25:GOSUB 3000:POSITION 0,18
860 PRINT "YOU HAVE NOT SAVED THIS PUZZLE."
870 PRINT "ARE YOU SURE YOU WANT TO EXIT? ";
880 GOSUB 6000:NL=2:GOSUB 5500
890 ON ABS(K$)="Y" GOTO 170:GOTO 550
900 NL=5:GOSUB 5500:POSITION 0,18
910 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
920 GOSUB 2500:TRAP 1030
930 NL=1:GOSUB 5500:TS=SS$(1,4):FOR L=1 TO 15
940 TS$(LEN(T$)+1)=CHR$(64+L):T$(LEN(T$)+1)=SP$
950 NEXT L:LPRINT TS
960 LPRINT SS$(1,3);PT$:FOR Y=1 TO 15
970 TS$=NS$(Y*3-2,Y*3):TS$(4)="#"":TS$(5)=SP$:FOR X=1 TO 15
980 Z=Y*30+X*2-31:Z$=BD$(Z,Z+1)
990 IF Z$>>BK$ THEN TS$(LEN(T$)+1)=Z$:GOTO 1010
1000 TS$(LEN(T$)+1)="*"
1010 NEXT X:LPRINT T$;"#":SP$:NS$(Y*3-2,Y*3):NEXT Y
1020 LPRINT SS$(1,3);PT$:TRAP 40000:GOTO 550
1030 SL=50:GOSUB 3000:GOTO 900
1040 GOSUB 6500:ON (FS="") GOTO 470:GOTO 170
1050 IF (K$<"A" OR K$>"Z") AND K$>P$ THEN SL=15:GOSUB
    3000:GOTO 710
1060 K$(2)=SP$
1070 T=CY*30+CX*2-31:BD$(T,T+1)=K$
1080 POSITION CX*2+3,CY+1:PRINT K$
1090 DK=SK:GOSUB 5000:GOTO 690
1100 LM=1:TM=0:WD=30:HT=15:GOSUB 2000
1110 POSITION 8,0:PRINT " INPUT FC DATA ":GOSUB 3500
1120 ZY=1:H$=UL$:T$=UL$:FOR L=1 TO 4
1130 H$(LEN(H$)+1)="",":H$(LEN(H$)+1)=UL$
1140 T$(LEN(T$)+1)=UL$:NEXT L:CD$=""
1150 POSITION 3,ZY:PRINT CHR$(64+ZY);SP$:H$;
1160 ZX=0:L$=T$;
1170 POSITION 0,18
1180 PRINT "PRESS <RETURN> TO MOVE TO NEXT LINE"
1190 PRINT "OR <CTRL>+<E> TO EXIT WITHOUT SAVING."
1200 T=ASC(L$(ZX+1,ZX+1)):POSITION ZX+5+INT(ZX/4),ZY
1210 PRINT CHR$(T+128):GOSUB 2500
1220 POSITION ZX+5+INT(ZX/4),ZY:PRINT CHR$(T)

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1230 DK=0:FOR L=1 TO 2:IF CU$(L,L)=KS THEN DK=L:L=2
1240 NEXT L:IF DK=0 THEN 1270
1250 ZX=ZX-(DK=1)+(DK=2)
1260 ZX=ZX+((ZX=-1)-(ZX=20))*20:GOTO 1200
1270 IF KS<>CHR$(5) THEN SL=30:GOSUB 3000:GOTO 170
1280 IF K$<>CHR$(155) THEN 1540
1290 NL=2:GOSUB 5500:CV=0:TRAP 1310
1300 CV=VAL(LS(17,20))
1310 TRAP 4000:CT=0:FOR L=1 TO 16
1320 CT=CT+ASC(LS(L,L)):NEXT L
1330 IF CT>CV*5000 THEN 1370
1340 SL=30:GOSUB 3000:POSITION 0,18
1350 PRINT "YOU HAVE MADE A TYPO IN LINE ";CHR$(64+ZY)
;""
1360 GOSUB 4000:NL=3:GOSUB 5500:ZX=0:GOTO 1170
1370 IF CV>5000 THEN 1400
1380 CD$(LEN(CD$)+1)=LS(1,16):ZY=ZY+1
1390 ON (ZY<16) GOTO 1150:GOTO 1430
1400 T=16:FOR L=1 TO 15 STEP 2
1410 IF LS(L,L)="Z" THEN T=L-1:L=15
1420 NEXT L:CD$(LEN(CD$)+1)=LS(1,T)
1430 FOR L=1 TO LEN(CD$)-1 STEP 2
1440 X=ASC(CD$(L,L))-64
1450 Y=ASC(CD$(L+1,L+1))-64
1460 T=Y*30+X*2-31:BD$(T,T+1)=BK$:NEXT L
1470 GOSUB 6500
1480 IF F$="" THEN SL=30:GOSUB 3000:GOTO 1470
1490 PRINT CS$;"PRESS <M> FOR MENU OR <S> TO SOLVE"
1500 PRINT "THE PUZZLE."
1510 GOSUB 2500:IF KS<>"M" AND KS<>"S" THEN SL=15:GOSUB 3000:GOTO 1510
1520 IF KS="M" THEN 170
1530 MS=4:W=1:C$="EASDP":GOTO 470
1540 KS=CHR$(K-(K>96)*(K<123)*32)
1550 IF (KS<"A" OR KS>"Z") AND (KS<"0" OR KS>"9") THEN
SL=15:GOSUB 3000:GOTO 1200
1560 POSITION ZX+5+INT(ZX/4),ZY
1570 PRINT KS:LS(ZX+1,ZX+1)=KS
1580 ZX=ZX+1-(ZX=19):GOTO 1200
1590 SL=30:GOSUB 3000
1600 PRINT "ARE YOU SURE YOU WANT TO QUIT? ";
1610 GOSUB 6000:IF KS="N" THEN 170
1620 PRINT CS$,:POKE 752,0:END
2000 POSITION LM, TM:PRINT CHR$(17);HL$(1,WD-2);CHR$(5)
2010 FOR Y=1 TO HT:POSITION LM, TM+Y
2020 PRINT CHR$(124);SS(1,WD-2);CHR$(124):NEXT Y
2030 POSITION LM, TM+HT+1
2040 PRINT CHR$(26);HL$(1,WD-2);CHR$(3):RETURN
2500 OPEN #1,4,0,"K":GET #1,K
2510 KS=CHR$(K-(K>96)*(K<123)*32)
2520 CLOSE #1:RETURN
3000 SOUND 1,150,30,15:FOR D=1 TO SL:NEXT D
3010 SOUND 1,0,0,0:RETURN
3500 BD$(1)=MS:BD$(448)=MS:BD$(3)=BD$:RETURN
4000 PRINT :PRINT "PRESS ANY KEY TO CONTINUE.";
4010 GOSUB 2500:RETURN
4500 PRINT :SL=30:GOSUB 3000:PRINT "DISK I/O ERROR."
4510 PRINT :PRINT "PLEASE CHECK DISK AND DISK DRIVE."
4520 GOSUB 4000:RETURN
5000 ON DK GOTO 5010,5010,5030,5030
5010 CX=CX-(DK=1)+(DK=2)
5020 CX=CX+((CX=0)-(CX=16))*15:GOTO 5050
5030 CY=CY-(DK=3)+(DK=4)
5040 CY=CY+((CY=0)-(CY=16))*15
5050 T=CY*30+CX*2-31
5060 IF BD$(T,T+1)=BK$ AND W=1 THEN 5000
5070 RETURN
5500 POSITION 0,18:FOR L=1 TO NL:PRINT SS
5510 NEXT L:RETURN
6000 GOSUB 2500
6010 IF KS<>"Y" AND KS<>"N" THEN SL=15:GOSUB 3000:GOTO 6000
6020 RETURN
6500 PRINT CS$;"SAVE UNDER WHAT NAME";:POKE 752,0

```

Macintosh (printer optional)/Crossword Puzzler

```

10 DIM BDS(15,15), CMS(2), DMS(2), NS(15)
20 CALL HIDECURSOR:CALL TEXTFONT(4):CALL TEXTSIZE(9)
30 CALL TEXTMODE(0):WIDTH 85
40 WINDOW 1, "CROSSWORD PUZZLER", (0,38)-(527,338)
50 SP$=CHR$(32):BK$="*"+SP$:CL$=STRINGS(37,SP$)
60 UL$=STRINGS(4,95):DMS(1)="- ACROSS"+SP$
70 DMS(2)="-- DOWN"+SP$+SP$+SP$:OP$=<OPTION>+
80 FOR L=1 TO 15:NS(L)=MID$(STR$(L),2)+SP$:NEXT L
90 CMS(1)=""":CMS(2)=""":CUS=""
100 FOR L=1 TO 6:READ T:CMS(1)=CMS(1)+CHR$(T):NEXT L
110 FOR L=1 TO 5:READ T:CMS(2)=CMS(2)+CHR$(T):NEXT L
120 FOR L=1 TO 4:READ T:CUS=CUS+CHR$(T):NEXT L
130 CLS:CALL TEXTSIZE(18):PRINT
140 PRINT "<1> Create your own crossword puzzle"
150 PRINT "<2> Work on an existing puzzle"
160 PRINT "<3> Create a puzzle using FC data"
170 PRINT "<4> Solve a puzzle":PRINT "<5> Quit"
180 PRINT:PRINT TAB(14); "Selection: ";
190 GOSUB 2000:MS=VAL(K$):CALL TEXTSIZE(9)
200 IF MS<1 OR MS>5 THEN SOUND 400,2:GOTO 190
210 CLS:ON MS GOTO 220,220,1150,240,1630
220 C$=CMS(1):W=0:IF MS=2 THEN 250
230 GOSUB 2500:GOTO 430
240 C$=CMS(2):W=1
250 CLS:INPUT "What is the name of this puzzle":F$ 
260 IF F$="" THEN 130
270 ON ERROR GOTO 410
280 OPEN FS FOR INPUT AS #1:INPUT#1,T
290 IF W=0 AND T=1 THEN 360
300 FOR Y=1 TO 15:FOR X=1 TO 15:INPUT#1,BD$(X,Y)
310 NEXT X,Y:CLOSE#1:ON ERROR GOTO 0
320 IF W=0 OR T=1 THEN 430
330 FOR X=1 TO 15:FOR Y=1 TO 15
340 IF BD$(X,Y)<>BK$ THEN BD$(X,Y)=SP$
350 NEXT Y,X:GOTO 430
360 CLOSE#1:ON ERROR GOTO 0:CLS:SOUND 400,6
370 PRINT "Sorry! This file is not loadable from"
380 PRINT "menu choice 2.":PRINT "Select ";
390 PRINT "<4> Solve a puzzle to load it."
400 GOSUB 3000:GOTO 250
410 CLOSE#1:RESUME 420
420 ON ERROR GOTO 0:GOSUB 3500:GOTO 250
430 CLS:LINE (100,3)-(400,290),,B
440 LINE (101,4)-(402,292),,B:LOCATE 2,28
450 FOR L=1 TO 15:PRINT CHR$(64+L);SP$:NEXT L
460 FOR X=160 TO 340 STEP 12:LINE (X,22)-(X,187)
470 NEXT X:FOR Y=22 TO 187 STEP 11
480 LINE (161,Y)-(339,Y):NEXT Y
490 LINE (159,21)-(341,188),,B:CALL TEXTMODE(2)
500 FOR Y=1 TO 15:LOCATE Y+2,25:PRINT NS(Y);
510 LOCATE Y+2,28:FOR X=1 TO 15:T$=BD$(X,Y)
520 IF T$=BK$ THEN CX=X:CY=Y:GOSUB 4000 ELSE LOCATE Y+2,X*2+26:PRINT T$;
530 NEXT X:LOCATE Y+2,58:PRINT NS(Y)
540 NEXT Y:SK=2:CALL TEXTMODE(0)
550 LOCATE 20,1:IF MS=4 THEN 590
560 PRINT TAB(24);OP$;"<A>=Across ";OP$;"<B>=Block"
570 PRINT TAB(24);OP$;"<D>=Down ";OP$;"<E>=Exit"
580 CX=1:CY=1:GOTO 640
590 CX=0:CY=0:FOR Y=1 TO 15:FOR X=1 TO 15
600 IF BD$(X,Y)=SP$ THEN CX=X:CY=Y:X=15:Y=15
610 NEXT X,Y
620 PRINT TAB(24);OP$;"<A>=Across ";OP$;"<D>=Down"
630 PRINT TAB(24);OP$;"<E>=Exit"

```

PUZZLE

```

640 PRINT TAB(24);OP$;"<P>=Print Current Puzzle"
650 PRINT TAB(24);OP$;"<S>=Save & Return to Menu"
660 PRINT
670 PRINT TAB(24);OP$;"<K>=UP      ;OP$;"<M>=LEFT"
680 PRINT TAB(24);OP$;"<,>=DOWN   ;OP$;"<.>=RIGHT"
690 IF CX<>0 THEN 720
700 BD$(1,1)=SP$:CX=1:CY=1:GOSUB 4500:CALL TEXTMODE(2)
710 LOCATE 4,28:PRINT SP$:CALL TEXTMODE(0)
720 CALL TEXTFACE(1):LOCATE 19,30
730 PRINT CHR$(64+CX);N$(CY);DM$(SK/2)
740 CALL TEXTFACE(0)
750 T$=BD$(CX,CY):TX=12*CX+151:TY=11*CY+13
760 LINE (TX,TY)-(TX+6,TY+7),33,BF
770 LINE (TX,TY)-(TX+6,TY+7),30,BF
780 IF TS=BKS THEN GOSUB 4000:GOTO 800
790 IF TS<>SP$ THEN CALL TEXTMODE(2):LOCATE CY+2,CX*2+
26:PRINT TS:CALL TEXTMODE(0)
800 K$=INKEY$:IF K$="" THEN 760
810 DK=INSTR(CUS$,K$)
820 IF DK<>0 THEN GOSUB 5000:GOTO 720
830 IF K$<CHR$(122) THEN 1110
840 CK=INSTR(CS$,K$)
850 IF CK=0 THEN SOUND 400,2:GOTO 750
860 IF W=0 THEN ON CK GOTO 880,900,910,900,960,1100
870 ON CK GOTO 910,900,1100,900,960
880 K$=BKS:GOSUB 4000
890 BD$(CX,CY)=BKS:GOTO 1140
900 SK=CK:GOTO 720
910 NL=8:GOSUB 5500:SOUND 400,4:LOCATE 19,24
920 PRINT "You have not saved this puzzle."
930 PRINT TAB(24); "Are you sure you want to exit? "
940 GOSUB 6000:NL=2:GOSUB 5500
950 IF K$="Y" THEN 130 ELSE 550
960 NL=8:GOSUB 5500:LOCATE 19,24:CALL TEXTMODE(2)
970 PRINT "Press any key when printer is ready.";
980 IF INKEY$="" THEN 980
990 CALL TEXTMODE(0):WIDTH LPRINT 255
1000 NL=1:GOSUB 5500:LPRINT SPC(5);:FOR L=1 TO 15
1010 LPRINT CHR$(64+L);SP$;:NEXT L:LPRINT
1020 LPRINT SPC(3);STRING$(33,"#")
1030 FOR Y=1 TO 15:LPRINT N$(Y);
1040 IF Y<10 THEN LPRINT SP$;
1050 LPRINT "#";SP$;:FOR X=1 TO 15:TS=BD$(X,Y)
1060 IF TS=SP$ THEN LPRINT ".":SP$;:GOTO 1080
1070 IF TS<>BKS THEN LPRINT TS;SP$; ELSE LPRINT "*";SP$;
1080 NEXT X:LPRINT "#";SP$;N$(Y):NEXT Y
1090 LPRINT SPC(3);STRING$(33,"#"):GOTO 550
1100 GOSUB 6500:IF FS="" THEN 430 ELSE 130
1110 GOSUB 2010:IF (K$<"A" OR K$>"Z") AND K$<>SP$ THEN
SOUND 400,2:GOTO 750
1120 GOSUB 4500:BD$(CX,CY)=K$:CALL TEXTMODE(2)
1130 LOCATE CY+2,CX*2+26:PRINT K$:CALL TEXTMODE(0)
1140 DK=SK:GOSUB 5000:GOTO 720
1150 CALL TEXTFACE(1):PRINT TAB(6); "INPUT FC DATA"
1160 CALL TEXTFACE(0):GOSUB 2500:ZY=1:H$=UL$
1170 FOR L=1 TO 4:H$=H$+", "+UL$:NEXT L:CD$=""
1180 CALL TEXTFACE(1):LOCATE ZY+2,1:PRINT CHR$(64+ZY)
1190 PRINT H$:L$=STRING$(20,95):ZX=0
1200 CALL TEXTFACE(0):LOCATE ZY+2,3
1210 LOCATE 20,1:PRINT "<ENTER>=Move to next line"
1220 PRINT "<OPTION>+<E>=Exit without saving."
1230 PRINT "<OPTION>+<M>=Cursor Left"
1240 PRINT "<OPTION>+<,>=Cursor right"
1250 TX=(ZX+INT(ZX/4))*6+14:TY=ZY*11+11
1260 CALL TEXTMODE(2):LINE (TX,TY)-(TX+5,TY+9),33,BF
1270 LINE (TX,TY)-(TX+5,TY+9),30,BF
1280 LOCATE ZY+2,ZX+3+INT(ZX/4):PRINT MID$(L$,ZX+1,1)
1290 K$=INKEY$
1300 IF K$="" THEN 1260 ELSE CALL TEXTMODE(0)
1310 DK=INSTR(LEFT$(CUS$,2),K$):IF DK=0 THEN 1340
1320 ZX=ZX+(DK=1)-(DK=2)
1330 ZX=ZX+((ZX=20)-(ZX=-1))*20:GOTO 1250
1340 IF K$=CHR$(228) THEN SOUND 400,6:GOTO 130
1350 IF K$<>CHR$(13) THEN 1580
1360 LOCATE 20,1:FOR L=1 TO 4
1370 PRINT CL$:NEXT L:CV=VAL(RIGHT$(L$,4))
1380 CT=0:FOR L=1 TO 16:CT=CT+ASC(MID$(L$,L,1)):NEXT L
1390 IF CT=CV+(CV>5000)*5000 THEN 1440
1400 SOUND 400,6:LOCATE 20,1
1410 PRINT "You have made a typo in line ";CHR$(64+ZY)
;"."
1420 GOSUB 3000:LOCATE 20,1:FOR L=1 TO 3
1430 PRINT CL$:NEXT L:ZX=0:GOTO 1210
1440 IF CV>5000 THEN 1470
1450 CD$=CD$+LEFT$(L$,16):ZY=ZY+1
1460 IF ZY<16 THEN 1180 ELSE 1500
1470 T=16:FOR L=1 TO 15 STEP 2
1480 IF MID$(L$,L,1)="Z" THEN T=L-1:L=15
1490 NEXT L:CD$=CD$+LEFT$(L$,T)
1500 FOR L=1 TO LEN(CD$)-1 STEP 2
1510 XS=MID$(CD$,L,1):YS=MID$(CD$,L+1,1)
1520 BD$(ASC(X$)-64,ASC(Y$)-64)=BKS:NEXT L
1530 GOSUB 6500:IF FS="" THEN SOUND 400,6:GOTO 1530
1540 CLS:PRINT "Press <M> for menu or <S> to solve the
puzzle.";
1550 GOSUB 2000:PRINT K$:IF K$<>"M" AND K$<>"S" THEN S
OUND 400,2:GOTO 1550
1560 IF K$="M" THEN 130
1570 MS=4:W=1:CS=CM$(2):GOTO 430
1580 GOSUB 2010:IF (K$<"A" OR K$>"Z") AND (K$<"0" OR K
$>"9") THEN SOUND 400,2:GOTO 1250
1590 LINE (TX,TY)-(TX+5,TY+9),30,BF:CALL TEXTMODE(2)
1600 LOCATE ZY+2,ZX+3+INT(ZX/4):PRINT K$
1610 CALL TEXTMODE(0):MID$(L$,ZX+1)=K$
1620 ZX=ZX+1+(ZX=19):GOTO 1250
1630 SOUND 400,2
1640 PRINT "Are you sure you want to quit?";
1650 GOSUB 6000:IF K$="N" THEN 130
1660 CLS:END
2000 K$=INKEY$:IF K$="" THEN 2000
2010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
2500 FOR X=1 TO 15:FOR Y=1 TO 15
2510 BD$(X,Y)=SP$:NEXT Y,X:RETURN
3000 PRINT:CALL TEXTFACE(1)
3010 PRINT "Press any key to continue.";
3020 CALL TEXTFACE(0)
3030 IF INKEY$="" THEN 3030 ELSE RETURN
3500 PRINT:CALL TEXTFACE(1):SOUND 400,6
3510 PRINT "Disk I/O error.":CALL TEXTFACE(0):PRINT
3520 PRINT "Please check disk and disk drive."
3530 GOSUB 3000:RETURN
4000 TX=12*CX+149:TY=11*CY+12
4010 LINE (TX,TY)-(TX+10,TY+9),33,BF:RETURN
4500 TX=12*CX+149:TY=11*CY+12
4510 LINE (TX,TY)-(TX+10,TY+9),30,BF:RETURN
5000 ON DK GOTO 5010,5011,5030,5031
5010 CX=CX+(DK=1)-(DK=2)
5020 CX=(CX+14) MOD 15+1:GOTO 5050
5030 CY=CY+(DK=3)-(DK=4)
5040 CY=(CY+14) MOD 15+1
5050 IF BD$(CX,CY)=BKS AND W=1 THEN 5000 ELSE RETURN
5500 FOR L=1 TO NL:LOCATE 18+L,24:PRINT CL$
5510 NEXT L:RETURN
6000 GOSUB 2000
6010 IF K$<>"Y" AND K$<>"N" THEN SOUND 400,2:GOTO 6000
6020 RETURN
6500 CLS:INPUT "Save under what name":FS
6510 IF FS="" THEN RETURN
6520 ON ERROR GOTO 6560
6530 OPEN F$ FOR OUTPUT AS #1:PRINT#1,W
6540 FOR Y=1 TO 15:FOR X=1 TO 15:WRITE#1,BD$(X,Y)
6550 NEXT X,Y:CLOSE#1:ON ERROR GOTO 0:RETURN
6560 CLOSE#1:RESUME 6570
6570 ON ERROR GOTO 0:GOSUB 3500:F$="":RETURN
7000 DATA 245,129,228,235,184,234
7010 DATA 228,129,234,235,184
7020 DATA 247,179,240,178

```

REVERSE SCROLLER

Use Our Program to Make Your Screen Go Backward

BY
THE FAMILY COMPUTING TECHNICAL STAFF

If you've spent any time reading a computer screen or typing in letters or programs, it's second nature for you to expect that when the screen fills up, new text will appear at the bottom and the oldest material will disappear off the top.

Suppose you could turn things topsy-turvy, with new lines showing up at the top and old lines going off the bottom? If you could, it would seem more realistic and make some programs easier to write. For example, in an auto race game, as faraway objects get closer, they move from the top of the screen to the bottom.

You can produce this same effect in your programs by using *Reverse Scroller*. This program



contains a small routine, or subprogram, which when called from a pro-

gram will make the contents of the screen scroll downward.

The program presented here is divided into four sections: the Printing, Installation, Scrolling, and Data sections.

- The *Printing* section (starting at line 10) is used to place the material to be scrolled on the screen.
- The *Installation* section (starting at line 200) READS the machine-language data in the *Data* section (starting at line 1000) and sets up the computer to scroll backward on command. These sections must be copied exactly as written.
- The *Scrolling* section (lines 300–330) demonstrates how to use the routine. This section is discussed below for each individual computer.

Apple II series

To scroll the screen down, use the command VTAB 24:CALL 768 (see line 300). The Apple II series of computers will respond by moving the screen down one line. We placed the command in a loop so as to scroll the screen down seven lines.

When using the routine in your own programs, first place the Installation section at the very beginning of your program. If you are using other machine-language routines in your program, be sure that they do not overlap with this routine. For example, FAMILY COMPUTING's music driver for the Apple II series of computers cannot be used in the same program as the *Reverse Scroller* routine.

Second, place the Data section before all other DATA statements in your program. Be careful if you're using a RESTORE statement in your program.

Finally, whenever you want scrolling to occur, CALL the routine as described below in the section for your computer.

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UTILITY PROGRAM

A special feature of the Apple II routine is that you can scroll just part of the screen by changing the number in the VTAB command. For example, if we used the command VTAB 12:CALL 768, the computer would scroll only the top 12 lines of the screen and leave the rest alone.

To scroll the screen back up, the program uses a loop that prints seven blank lines at the bottom of the screen.

Apple II series/Reverse Scroller

```
10 B$ = CHR$(32):SB$ = B$+B$:LB$ = SB$+SB$+SB$+B$  
20 HOME:INVERSE:VTAB 1:FOR X = 1 TO 2:HTAB 12  
30 PRINT SB$:LB$:HTAB 23:PRINT SB$:LB$:NEXT X  
40 FOR X = 3 TO 16:VTAB X:HTAB 12:PRINT SB$;  
50 HTAB 23:PRINT SB$:NEXT X  
60 FOR X = 6 TO 7:VTAB X:HTAB 12:PRINT LB$  
70 VTAB X+9:HTAB 25:PRINT LB$:NEXT X  
80 FOR X = 3 TO 4:VTAB X:HTAB 30:PRINT SB$:VTAB X+10  
90 HTAB 30:PRINT SB$:NEXT X:NORMAL  
199 REM --INSTALL REVERSE-SCROLLER MACHINE LANGUAGE--  
200 FOR S = 768 TO 812:READ A:POKE S,A:NEXT S  
300 FOR L = 1 TO 7:VTAB 24:CALL 768  
310 FOR D = 1 TO 100:NEXT D:NEXT L  
320 VTAB 24:FOR L = 1 TO 7:PRINT  
330 FOR D = 1 TO 100:NEXT D:NEXT L:GOTO 300  
1000 DATA 162,23,165,40,133,66,165,41,133,67,32,26,252  
1010 DATA 165,40,133,60,24,105,39,133,62,165,41,133,61  
1020 DATA 133,63,32,44,254,202,208,224,169,160,162,39  
1030 DATA 157,0,4,202,16,250,96
```

—APPLE VERSION BY PETER COCKROFT

Atari 800/XL/XE

The command in the Atari version is U=USR(1536) (see line 300). The computer will respond by moving the screen down one line. We placed the command in a loop so as to scroll the screen down seven lines.

To scroll the screen back up, we used a loop that prints seven blank lines.

Atari 800/XL/XE/Reverse Scroller

```
10 DIM LB$(7),SB$(2)  
20 FOR X=1 TO 7:LB$(X)=CHR$(160):NEXT X  
30 SB$(1,2)=LB$(1,2):POKE 752,1:PRINT CHR$(125);  
40 FOR X=1 TO 2:POSITION 11,X:PRINT SB$:LB$  
50 POSITION 22,X:PRINT SB$:LB$:NEXT X  
60 FOR X=3 TO 16:POSITION 11,X:PRINT SB$  
70 POSITION 22,X:PRINT SB$:NEXT X  
80 FOR X=6 TO 7:POSITION 11,X:PRINT LB$  
90 POSITION 24,X+9:PRINT LB$:NEXT X  
100 FOR X=3 TO 4:POSITION 29,X:PRINT SB$  
110 POSITION 29,X+10:PRINT SB$:NEXT X  
199 REM --INSTALL REVERSE-SCROLLER MACHINE LANGUAGE--  
200 FOR X=1536 TO 1621:READ A:POKE X,A:NEXT X  
300 FOR L=1 TO 7:U=USR(1536)  
310 FOR D=1 TO 100:NEXT D:NEXT L  
320 POSITION 1,23:FOR L=1 TO 7:PRINT  
330 FOR D=1 TO 100:NEXT D:NEXT L:GOTO 300  
1000 DATA 165,88,24,105,151,133,203,165,89,105,0,133  
1010 DATA 204,24,105,3,133,204,160,0,169,152,133,0,169  
1020 DATA 3,133,1,165,203,24,105,40,133,206,165,204  
1030 DATA 105,0,133,207,177,203,145,206,165,203,56,233  
1040 DATA 1,133,203,165,204,233,0,133,204,165,0,56,233  
1050 DATA 1,133,0,165,1,233,0,133,1,5,0,208,209,160  
1060 DATA 39,169,0,145,88,136,16,251,104,96
```

—ATARI VERSION BY STEVE FEINSTEIN

Commodore 64 & 128 (C 64 mode)

To scroll the screen backward on a Commodore 64, give the computer a SYS 49152 command. This command will cause the computer to scroll the entire screen down one line. To scroll the screen down more than once, we placed the command in a loop.

To scroll the screen back up, print blank lines at the bottom of the screen.

Commodore 64 & 128 (C 64 mode)/Reverse Scroller

```
10 LB$=CHR$(18):FOR X=1 TO 7:LB$=LB$+CHR$(32)  
20 NEXT X:SB$=LEFT$(LB$,3):PRINT CHR$(147);  
30 POKE 214,0:PRINT:FOR X=0 TO 1  
40 PRINT SPC(10);SB$:LB$:SPC(2);SB$:LB$:NEXT X  
50 FOR X=2 TO 15:PRINT SPC(10);SB$:SPC(9);SB$:NEXT X  
60 FOR X=5 TO 6:POKE 214,X:PRINT:PRINT SPC(10);LB$  
70 POKE 214,X+9:PRINT:PRINT SPC(23);LB$:NEXT X  
80 FOR X=2 TO 3:POKE 214,X:PRINT:PRINT SPC(28);SB$  
90 POKE 214,X+10:PRINT:PRINT SPC(28);SB$:NEXT X  
199 REM --INSTALL REVERSE SCROLLER MACHINE LANGUAGE--  
200 FOR S=49152 TO 49270:READ A:POKE S,A:NEXT S  
300 FOR L=1 TO 7:SYS 49152  
310 FOR D=1 TO 100:NEXT D:NEXT L  
320 POKE 214,23:PRINT:FOR L=1 TO 7:PRINT  
330 FOR D=1 TO 100:NEXT D:NEXT L:GOTO 300  
1000 DATA 169,192,133,155,169,3,133,156,169,191,133  
1010 DATA 163,133,251,169,7,133,164,24,105,212,133,252  
1020 DATA 169,231,133,165,133,253,169,7,133,166,24,105  
1030 DATA 212,133,254,160,0,177,163,145,165,177,251  
1040 DATA 145,253,165,163,164,164,32,112,192,133,163  
1050 DATA 133,251,132,164,152,24,105,212,133,252,165  
1060 DATA 165,164,166,32,112,192,133,165,133,253,132  
1070 DATA 166,152,24,105,212,133,254,165,155,164,156  
1080 DATA 32,112,192,133,155,132,156,5,156,208,193,160  
1090 DATA 39,169,32,153,0,4,136,16,250,96,56,233,1,176  
1100 DATA 1,136,96
```

—COMMODORE 64 VERSION BY STEVE FEINSTEIN

IBM PC & compatibles

The IBM PC version is different from the other versions in that you can use the same command to scroll the screen either UP or DOWN and to scroll the screen any number of lines. The general form of the command is CALL SCROLL(DIRECTION,NL) where DIRECTION must be either UP or DOWN and NL can be any number from one to 24. (UP and DOWN must be initialized to six and seven as shown in line 200.) In our example, we used NL=1 (see line 200) and put the command in a loop that's executed seven times so that the screen scrolls gradually. If we were to replace lines 300–310 with 300 CALL SCROLL(DOWN,7), the screen would jump seven lines downward without pausing at the intermediate lines.

This same command could be used to scroll the screen upward just by changing the direction to UP and by inserting a value for NL.

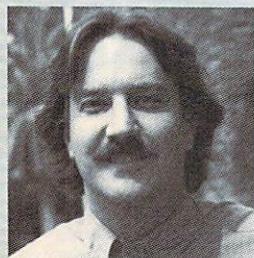
IBM PC & compatibles/Reverse Scroller

```
10 DEFINT A-Z:DEF SEG=&H40  
20 IF (PEEK(&H10) AND 48)=32 THEN WIDTH 40  
30 KEY OFF:CLS:LOCATE ,0  
40 LB$=STRING$(7,219):SB$=STRING$(2,219)  
50 FOR X=2 TO 3:LOCATE X,12  
60 PRINT SB$:LB$:SPC(2);SB$:LB$:NEXT X  
70 FOR X=4 TO 17:LOCATE X,12:PRINT SB$:SPC(9);SB$  
80 NEXT X:FOR X=7 TO 8:LOCATE X,12:PRINT LB$:NEXT X  
90 FOR X=16 TO 17:LOCATE X,25:PRINT LB$:NEXT X  
100 FOR X=4 TO 5:LOCATE X,30:PRINT SB$:LOCATE X+10,30  
110 PRINT SB$:NEXT X  
199 REM --INSTALL REVERSE-SCROLLER MACHINE LANGUAGE--  
200 DEF SEG=&H1700:UP=6:DOWN=7:NL=1:FOR S=0 TO 30  
210 READ D$:POKE S,VAL("&H"+D$):NEXT S  
300 FOR D=1 TO 7:CALL SCROLL(DOWN,NL)  
310 FOR S=1 TO 200:NEXT S:NEXT D  
320 FOR U=1 TO 7:CALL SCROLL(UP,NL)  
330 FOR S=1 TO 200:NEXT S:NEXT U:GOTO 300  
1000 DATA 55,8B,EC,8B,76,08,8B,04,8A,E0,8B  
1010 DATA 76,06,8B,1C,8A,C3,B7,07,B9,00,00  
1020 DATA BA,4F,18,CD,10,5D,CA,04,00
```

—IBM PC VERSION BY GEORGE KOSTOPOULOS

THREE-VOICE SOUND EFFECT

BY JOEY LATIMER



Spice up your programs with this *Three-Voice Sound Effect*. To listen to the sound effect, just type the program "as is" into your computer, SAVE it, then RUN it, making sure your speaker volume is turned up.

The *Three-Voice Sound Effect* uses three musical voices to sound off in a rather rich fashion. The first voice PLAYS the main tone or frequency (called F in my program), which is determined by randomly selecting a number within

certain limits. The second and third voices are tuned slightly higher or lower in pitch than the first voice. This technique is sometimes referred to as "detuning" and gives the resulting sound a feeling of depth that can't be achieved with one-voice sound effects.

PROGRAMMING NOTES: If you include the routine in your program, be sure to type the lines immediately following line nine near the beginning of your program and locate the Sound Routine at 1000; then call the routine with GOSUB 1000 at the point in the program where you want the sound to play. Be sure to reset the number of notes played if you want to change the length of the sound effect. For example, to make the sound effect longer, change the number of notes played in line 100 (NN = 40) to a larger number, such as 80.

Atari 800/XL/XE/Three-Voice Sound Effect

```
99 REM --SET NUMBER OF NOTES AND CALL SOUND ROUTINE--
100 NN=40:GOSUB 1000
110 END
999 REM --SOUND ROUTINE--
1000 FOR T=1 TO NN:X=INT(RND(1)*220)+20
1010 SOUND 0,X,10,8:SOUND 1,X-1,10,6
1020 SOUND 2,X+1,10,4:FOR DE=1 TO 10:NEXT DE:NEXT T
1030 FOR DE=1 TO 90:NEXT DE
1040 SOUND 0,0,0,0:SOUND 1,0,0,0
1050 SOUND 2,0,0,0:RETURN
```

Commodore 64 & 128 (C 64 mode)/Three-Voice Sound Effect

```
9 REM --INITIALIZE SOUND CHIP--
10 S=54272:FOR X=0 TO 23:POKE S+X,0:NEXT X
20 POKE S+24,15:POKE S+5,68:POKE S+6,68
30 POKE S+12,68:POKE S+13,68
40 POKE S+19,68:POKE S+20,68
99 REM --SET NUMBER OF NOTES AND CALL SOUND ROUTINE--
100 NN=40:GOSUB 1000
110 END
999 REM --SOUND ROUTINE--
1000 POKE S+4,33:POKE S+11,33:POKE S+18,33
1010 FOR X=1 TO NN
1020 F=INT(RND(1)*5000)+700
1030 F1=INT(F/256):F2=F-256*F1
1040 F3=INT((F-7)/256):F4=F-7-256*F3
1050 F5=INT((F+7)/256):F6=F+7-256*F5
1060 POKE S+1,F1:POKE S,F2
1070 POKE S+8,F3:POKE S+7,F4
1080 POKE S+15,F5:POKE S+14,F6
1090 NEXT X:FOR DE=1 TO 175:NEXT DE
1100 POKE S+4,32:POKE S+11,32:POKE S+18,32:RETURN
```

IBM PCjr & compatibles/Three-Voice Sound Effect

```
9 REM --RANDOMIZE MELODIES; PREPARE SOUND ROUTINE--
10 RANDOMIZE TIMER:SOUND ON:P$="T120MBL16"
```

```
99 REM --SET NUMBER OF NOTES AND CALL SOUND ROUTINE--
100 NN=40:GOSUB 1000
110 END
999 REM --SOUND ROUTINE--
1000 PLAY P$,P$,P$:FOR X=1 TO NN
1010 F=INT(RND*40)+5:F2=INT(F/1.5):F3=INT(F*1.5)
1020 PLAY "N"+STR$(F),"N"+STR$(F2),"N"+STR$(F3)
1030 NEXT X
1040 RETURN
```

Macintosh/Three-Voice Sound Effect

```
9 REM --INITIALIZE SOUND CHIP--
10 WAVE 0,SIN:WAVE 1,SIN:WAVE 2,SIN
99 REM --SET NUMBER OF NOTES AND CALL SOUND ROUTINE--
100 NN=40:GOSUB 1000
110 END
999 REM --SOUND ROUTINE--
1000 FOR X=1 TO NN
1010 F=RND*1000+200
1020 SOUND F,0,,0:SOUND F+7,1,,0:SOUND F-7,2,,0
1030 NEXT X
1040 SOUND 0,0,,0:SOUND 0,1,,0:SOUND 0,2,,0
1050 RETURN
```

TI-99/4A/Three-Voice Sound Effect

```
9 REM --RANDOMIZE MELODIES--
10 RANDOMIZE
99 REM --SET NUMBER OF NOTES AND CALL SOUND ROUTINE--
100 NN=40
110 GOSUB 1000
120 END
999 REM --SOUND ROUTINE --
1000 FOR X=1 TO NN
1010 F=INT(RND*1000)+120
1020 CALL SOUND(130,F,0,F-4,2,F+4,2)
1030 NEXT X
1040 RETURN
```

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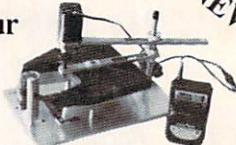
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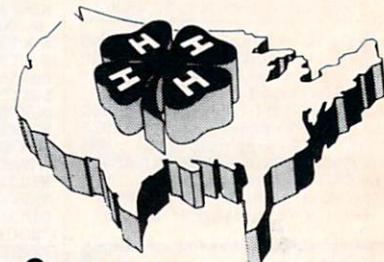
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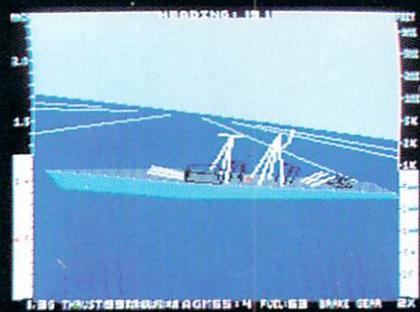
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